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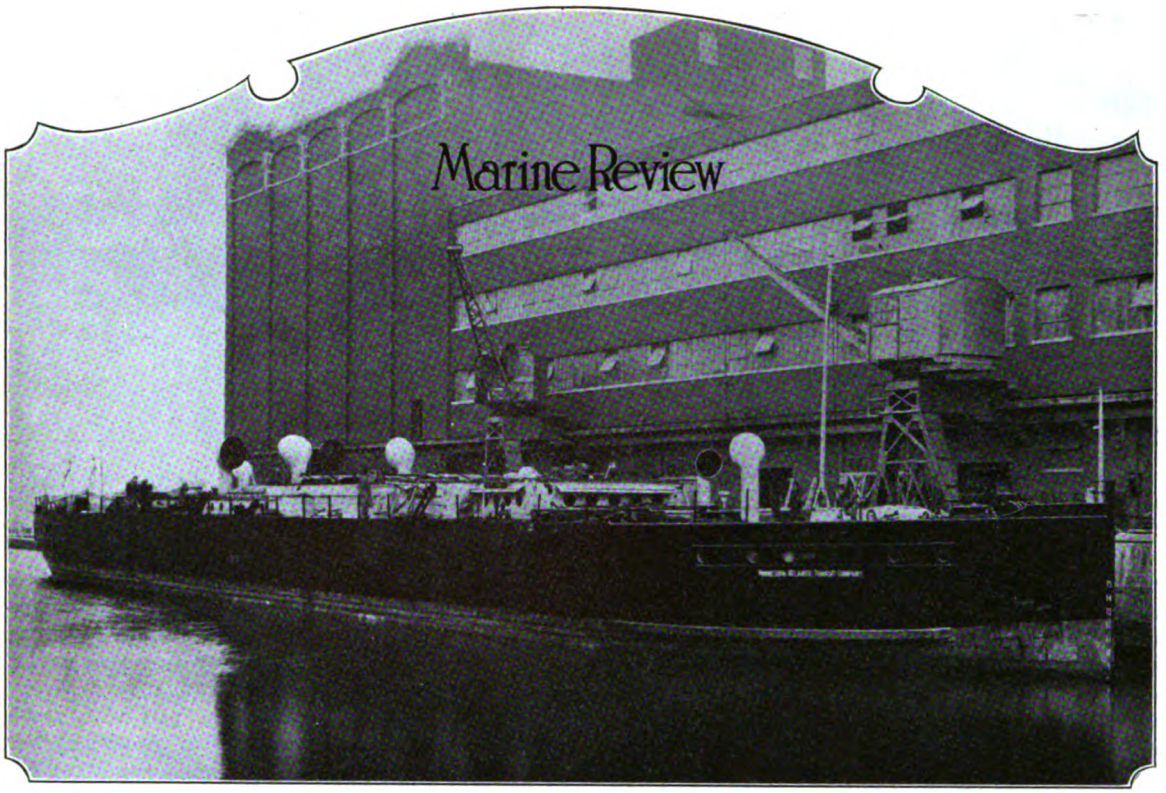


Motorship Twin Ports after making her first voyage from New York to Duluth. This vessel is designed to operate on the Great Lakes, New York state barge canal and in the Atlantic coastwise and West Indies trades

Run from Duluth to Caribbean

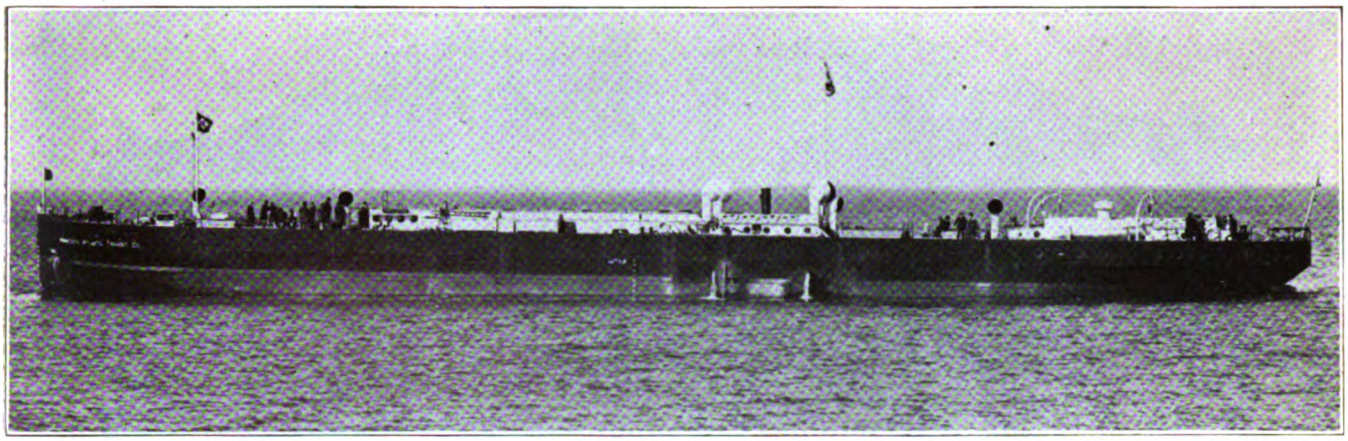
Ships Open New Route Which Takes Them Through Great Lakes, Barge Canal and to the Atlantic

TWO ships of unusual design, employing the uncommon diesel electric drive and able to meet Lake Superior gales, slide under the low bridges of the New York state barge canal and ride out the hurricanes of the West Indies, have just completed their first few weeks successful service. The results have led to the decision to build similar ships, definite announcement of the number to be made soon. The following article describes these ships.

Entrance of the McDougall Terminal Warehouse Co., Duluth, into the terminal and warehousing field and, through its subsidiary, the Minnesota-Atlantic Transit Co., into the transportation business between Duluth and eastern points, has been previously recorded in MARINE REVIEW. The company was organized by A. Miller McDougall, son of the late well known Capt. Alexander McDougall, and a group of the younger business men at the head of the lakes. A fine and completely equipped terminal has been built at Duluth and has been in operation since June, 1923. Mr. McDougall needs no introduction to shipping men familiar with the Great Lakes nor is this terminal his first venture into that field, he having been an organizer and executive of a similar and successful enterprise at Duluth and from which he resigned to take charge of the McDougall shipbuilding interests, known better as the McDougall-Duluth Co., during the war. The highly creditable record of this concern is well known to those familiar with the feverish activity of wartime shipbuilding.

The shipping features of the new undertaking, which form the water arm of the feeding and distributing system of the terminal, are of particular interest since they not only mark the first serious effort to utilize the New York state barge canal as a link in a through service between the Atlantic coast and the Northwest to which Duluth is the natural entry, but are the first full diesel engined ships to be built in a lake yard. They are a tribute to the vision and enterprise of the founders and to the resourcefulness and persistence of Henry Penton, the designer. The latter also is a familiar figure in the shipbuilding and engineering circles of the Great Lakes in which he has moved for many years. Mr. Penton will probably be always remembered for his record as the executive of the Emergency Fleet corporation for the Great Lakes district during its wartime shipbuilding program, a record unmatched by any other district of the country. For this work, he has steadily disclaimed credit, asserting that the shipbuilders of the lakes if left to themselves, unhampered and unaided, would have done the job just as well or better.

As one of the outstanding features of these ships is the mechanical equipment which takes the form of diesel-electric, its description might well include some references to the genesis of the electric drive. The first application of this form of drive, so far as known, was made in the two fireboats MEDILL MCCORMICK and GRAEME STEWART built in 1908 for the city of Chicago from designs by the late W. I. Babcock in collaboration with Mr. Penton as to the mechanical equipment. The statement as to priority of application is, of course, to be understood as referring to a drive by means of current generated on board, as numerous small applications of motor drive with battery current had been made in preceding years. The form of drive se-



MOTORSHIP TWIN CITIES ON TRIAL TRIP ON LAKE ERIE

lected for the fireboats really had its inception in the fact that the characteristics of the pumping equipment indicated turbo-pumps and, since pumping and propulsive duties were noncoincident and the power requirements for pumping were greatly in excess of those for propulsion, the fitting of a generator on an extension of each turbine rotor shaft and a motor to each propeller seemed a feasible and logical plan. With this was the added great advantage that it offered an opportunity of placing the entire control of the propelling units under the hand of the pilot in the pilot house and doing away entirely with operation by signal. The plan was adopted and the first electric drive became an accomplished fact. The vessels have been in continuous, satisfactory service to the present day.

Overlooking an Advantage

At that time, the diesel engine was beginning to be heard of in a commercial way but had not yet begun actively to compete with steam afloat. The electric drive, however, made rapid headway, principally in naval work for which it seemed particularly suited, but with few exceptions handling and maneuvering operations have continued to be performed in the engine room or from remote points on signal, and thus one of the chief advantages of the electric drive has not been realized. There seems to be two outstanding reasons for this; first, the violent opposition of deck officers to departure from the signalling method, and second, difficulty on the part of the designers of electrical equipment to realize service conditions aboard ship. This latter situation, however, is rapidly improving as electrical engineers extend their acquaintance with operation.

In the ships under review, a new and complicated set of operating conditions had again to be met and the MARINE REVIEW is enabled through information obtained directly from the owner and the designer, to present their solution.

The trade contemplated handling general and refrigerated merchandise over an all-water route and without breaking bulk between the head of the lakes and New York, a distance of approximately 1500 miles. The route included the Great Lakes via the Welland canal to Oswego, N. Y., on Lake Ontario, entering the barge canal at the latter port, thence by way of the barge canal and Hudson river to New York. Great Lakes, Welland canal and Hudson river navigation presented no particular problems other than somewhat restricted drafts in the upper Hudson but the barge canal bristled with difficulties.

The available draft which could be safely considered in the canal and the overhead obstructions in the way of permanent bridges determined arbitrarily the fixed vertical dimensions. The Welland locks, although allowing of much greater drafts, fixed the length and beam. The problem, therefore, was to design a vessel suited to the special needs of the trade as regards cargoes, and capable of open lake navigation in all ordinary weathers and yet meet the conditions imposed by the barge canal. It was further contemplated that the ships should be suitable for coastwise service during the winter months when lake and canal navigation is closed.

An Original Design

The difficulty of meeting these conditions has been long considered and often discussed and the general conclusion has been adverse. However, after about two years of intensive study, a design was worked out which seemed to promise success and was finally developed into an order for two ships. After taking bids from 10 builders on the coast and the Great Lakes, the contract was awarded to the Great Lakes Engineering Works, Detroit, to owners' design and specifications. The propelling machinery and equipment was furnished by the owner, as well as the refrigerating plant, including the insulation.

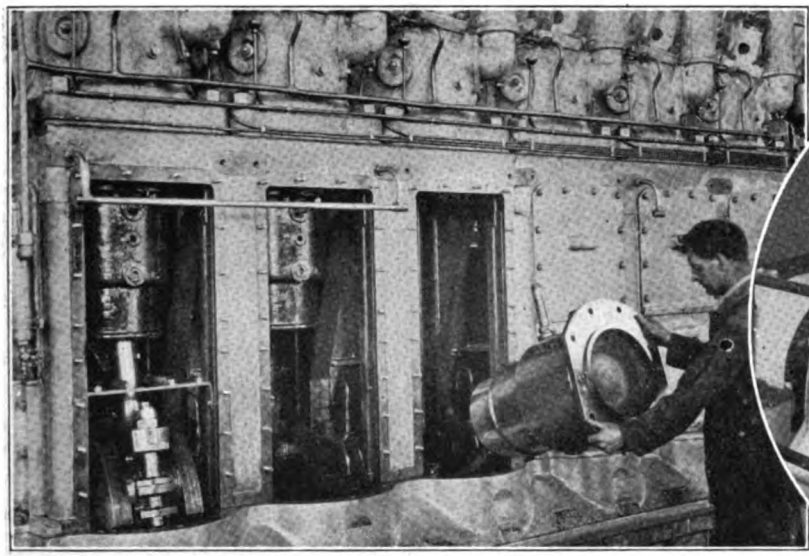
As a preliminary step, the lines of the vessel and the power requirements were investigated and checked by Prof. H. C. Sadler at the model basin at the University of Michigan. Both independent sets of calculations were in very close

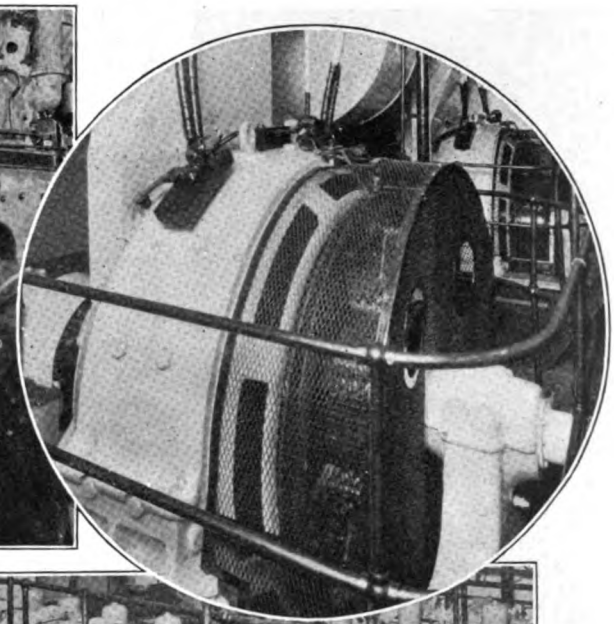
To the Editor Marine Review,

IN RESPONSE to your request for permission to publish a description of the new motorships of the Minnesota-Atlantic Transit Co., I desire to say that these vessels seem to have gathered totally unexpected attention. It had not occurred to us that we were attempting anything extraordinary; we had a problem to work out and went at it in our own way without, of course, much or anything in the way of precedent to assist us and it was inevitable that new lines must be struck out to meet the situation. Whether we have found the solution entirely, we do not yet know certainly; we are hopeful.

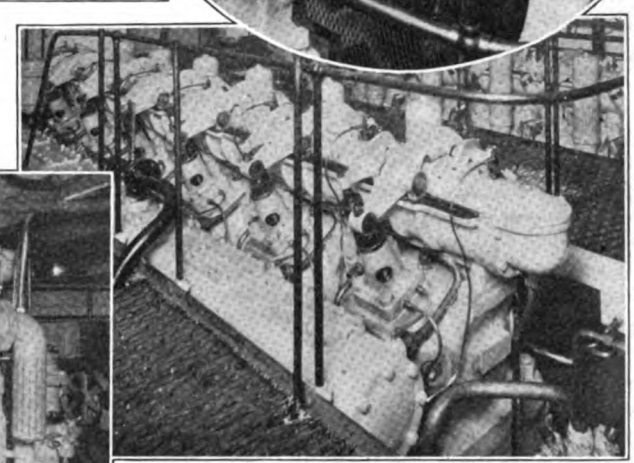
But there has been so much of an unauthorized, and in some cases misleading, character, published regarding these vessels, and not a few exaggerations, all regardless of our expressed wishes, that we think it best for the sake of engineering accuracy to set the record straight so far as we can. We should have preferred to avoid publicity for the present and until the vessels had been given some further trial, but if we have to have it anyway we want it accurate. In the data which we have given you as a basis for your description, some important items will doubtless be found missing, and these may be taken as not yet finally fixed, or in other words still subject to trial and observation. I am, very truly yours,

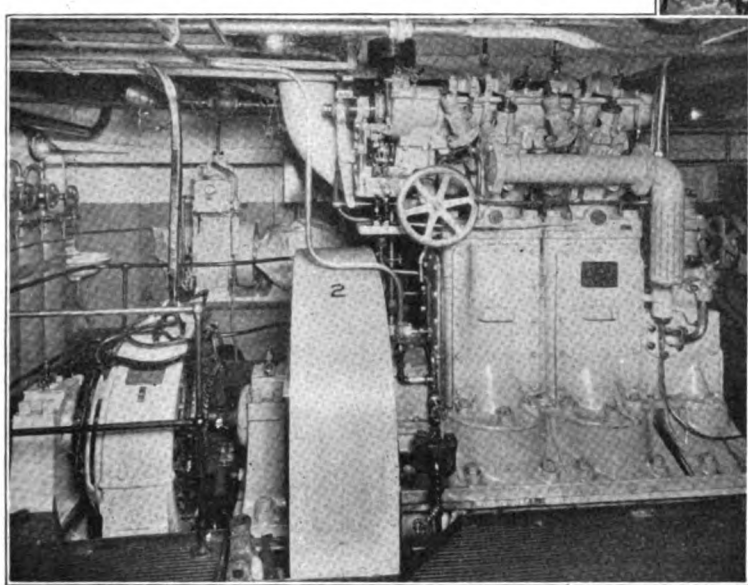
(Signed) H. PENTON,
Cleveland, Dec. 1, 1923.

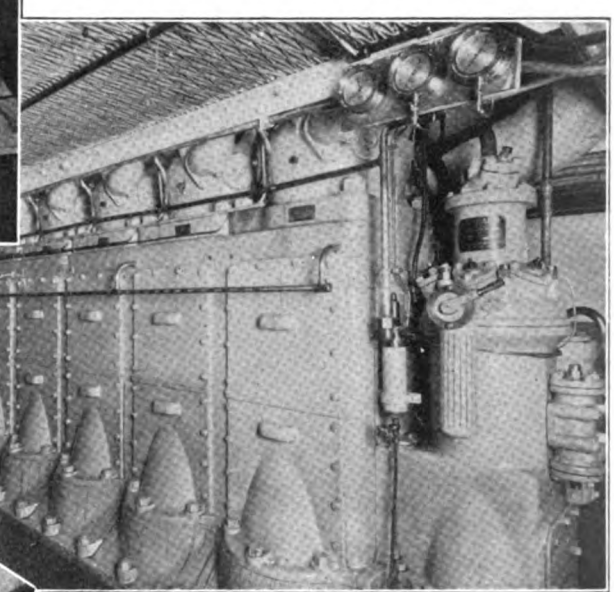


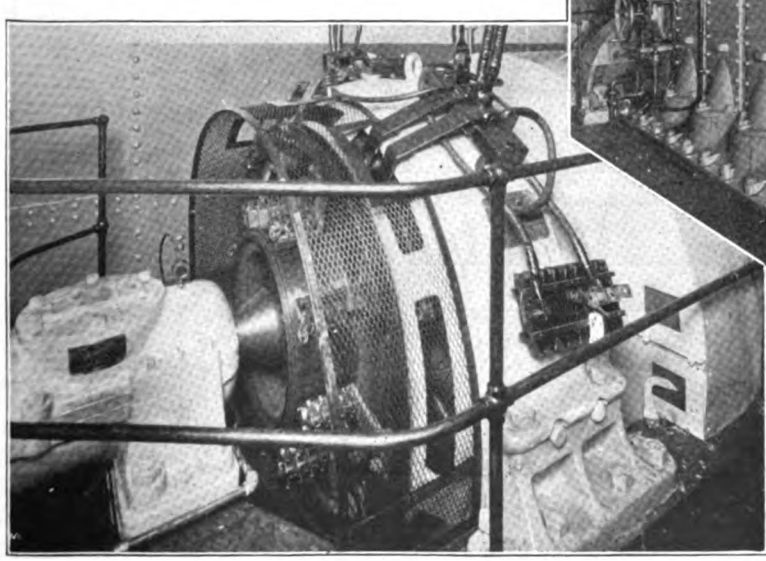


Above, method of handling pistons, connecting rods, etc. At right, starboard propelling motor with counter transmitter on end of armature shaft. Below, auxiliary diesel engine directly connected to 40-kilowatt generator









Above, two views of main engines, one from upper grating showing valve gear and one of after engine from inboard end, compressor in foreground. At left, 250 kilowatt generator directly connected to one of the main engines.

A. MILLER McDOUGALL
Head of the Minnesota-Atlantic Transit Co., owner of the new motorships

greement. The contract called for delivery of both ships by June 1, 1923, but from various causes delivery was delayed until Sept. 10 and Oct. 18, 1923, and the opportunity for observation in canal operation was, therefore, abridged to the last few weeks of the season.

The vessels have been named TWIN PORTS and TWIN CITIES, in honor respectively of the sister cities of Duluth and Superior at the head of Lake Superior and of Minneapolis and St. Paul which are usually coupled together under the latter appellation. TWIN PORTS was the first of the pair to go into commission.

Navigation of the barge canal might be said to resemble threading a needle. The vertical height from the bottom of the canal to the under side of the bridges being fixed and the water levels somewhat variable due to severe rain storms and other runoffs, particularly in the Mohawk section; the commercial necessity for the largest possible cubic and deadweight capacity; the varying density of cargoes and consequent load drafts; the necessity for preserving perfect trim and at the same time to quickly vary drafts to meet local conditions of water levels, made the problem no easy one. Operation in light or ballast trim also could not be contemplated and the ships must load in both directions.

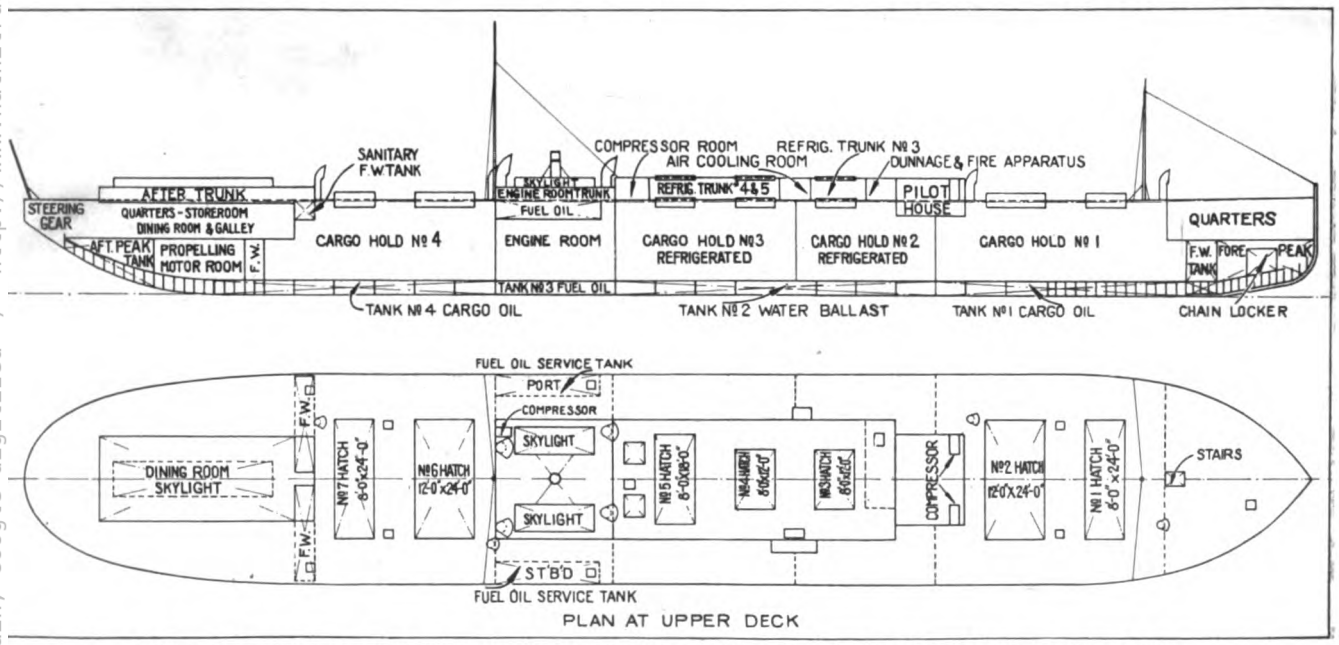
Maneuvering Ability Essential

The conditions demand perfect speed control, and even more imperatively maneuvering ability, over the entire speed range and these features were, therefore, the subject of special study. Being greatly larger than anything previously built for that trade, which fact alone naturally carried its own difficulties, every effort was bent toward minimizing delay, which meant maintaining as high an average canal speed as possible. This in turn demanded perfect steering control at even the lowest speeds. Although twin screws are made necessary by the power requirements and the restricted draft, they are valueless as an adjunct to steering and have not been considered in that connection. Effective work must be had under dead-slow ahead operation with either or both screws. Since the action of a rudder depends practically entirely upon the velocity of water across its face, a single center-line rudder fails completely, but by fitting a rudder

HENRY PENTON
Designer of the new motorships which operate in lake, canal and ocean trades

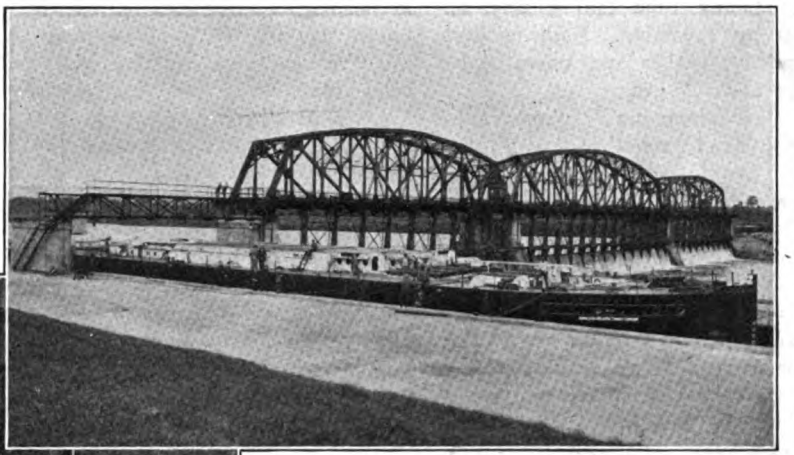
in the wake of each propeller as shown on page 6, the ship can be steered perfectly even with only one propeller in action and at any propeller speed.

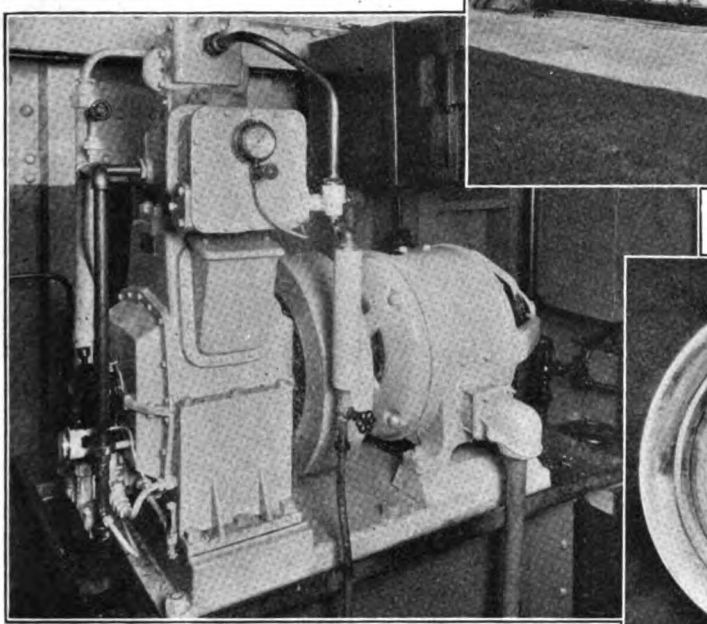
Experience with these vessels has shown that their maneuvering ability is all that can be desired. Practical men who have observed them in operation have been surprised. At full speed in deep water, the turning circle is not much over 300 feet in diameter and at a sustained low speed of under 2½ miles per hour in the shallowest stretches of the canal with one propeller in operation, the most difficult situations were negotiated easily and quickly and

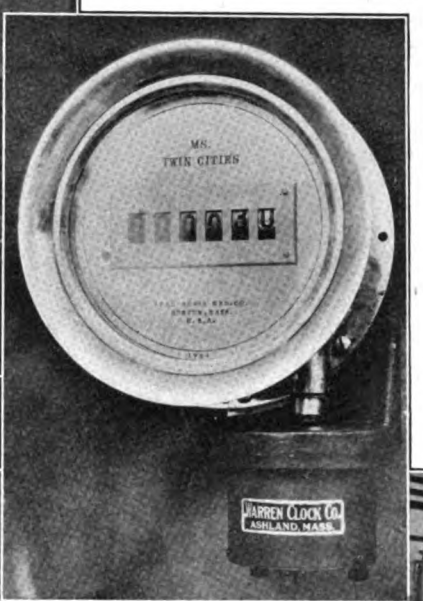


SECTIONAL AND PLAN VIEW OF DIESEL-DRIVEN LAKE AND OCEAN FREIGHTER TWIN PORTS

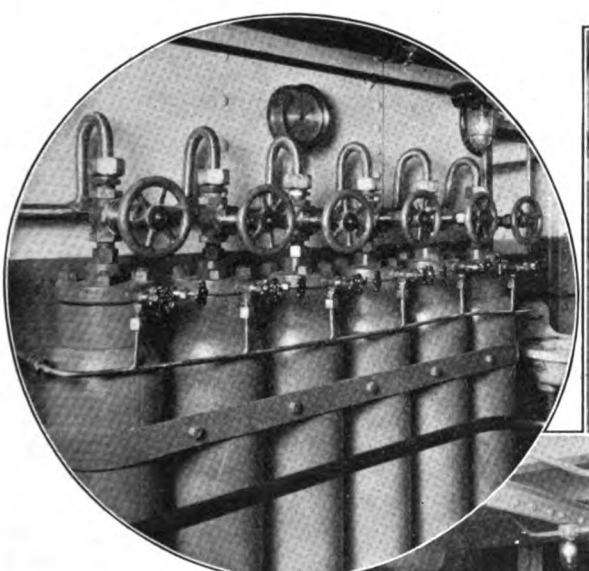
M. S. Twin Ports in locks at Amsterdam, N. Y., on first trip through canal. Below, auxiliary air compressor

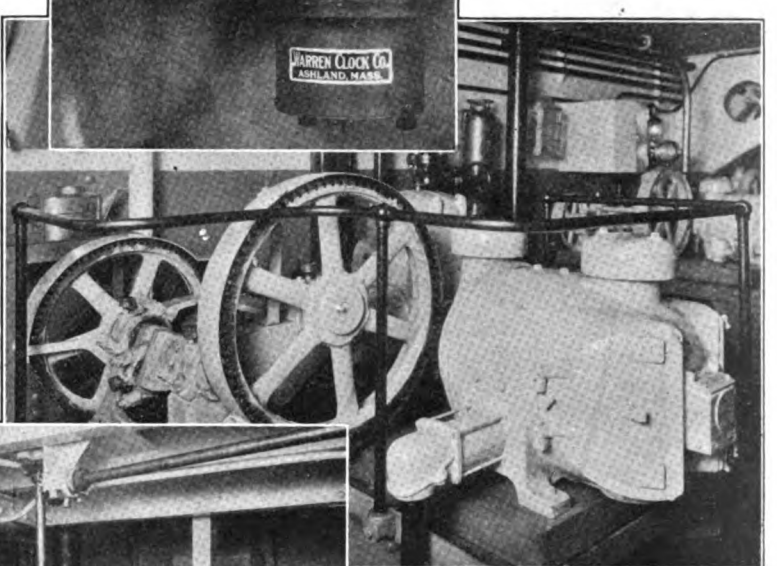


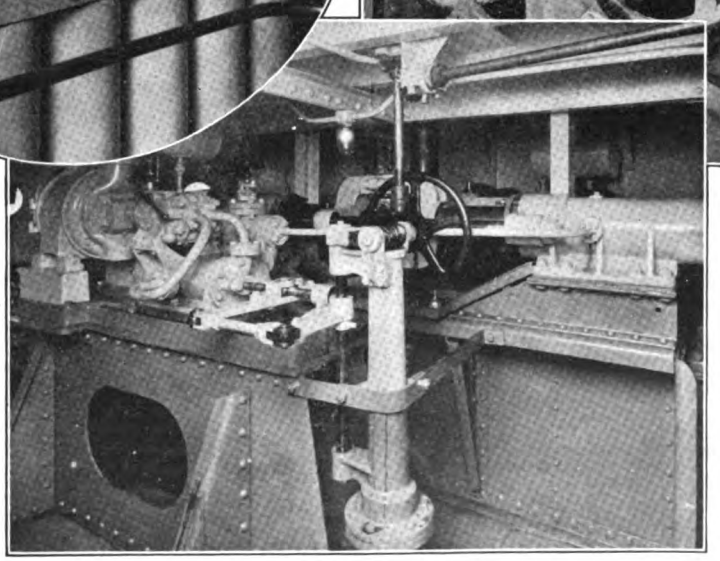




At left, remote revolution counter specially designed for these two ships. Below, general service pump







At left, electric steerer with hydraulic motor and beyond, starting air bottles

without at any time taking way off the ship by reversing. Both rudders are coupled together and operated by the same steering gear.

The accompanying photographs of the vessel together with the inboard profile give a good general idea of their construction. The dimensions are 258 feet on deck, 42 feet beam and 18 feet 9 inches molded depth. The gross and net register tonnages are 1460 and 840 respectively. The deadweight capacity on canal draft is about 1500 net tons and on load line drafts at sea 2600 net tons. The ships have been built to the classification of the American Bureau of Shipping for Great Lakes and coastwise service. They are constructed on the transverse system with a 3-foot double bottom all fore and aft from frame 17 to frame 114, which is under the motor room aft. The double bottom is divided into four compartments on each side, of which No. 2, under the refrigerated holds, is the largest. Tanks No. 1 and No. 4 are designed to carry cargo oil for the use of the terminal at Duluth and No. 3 is for diesel oil only. No. 2 tank is designed for water ballast only and to change load draft about one foot without change of trim. In addition, two service oil tanks are under decks in the engine room wings.

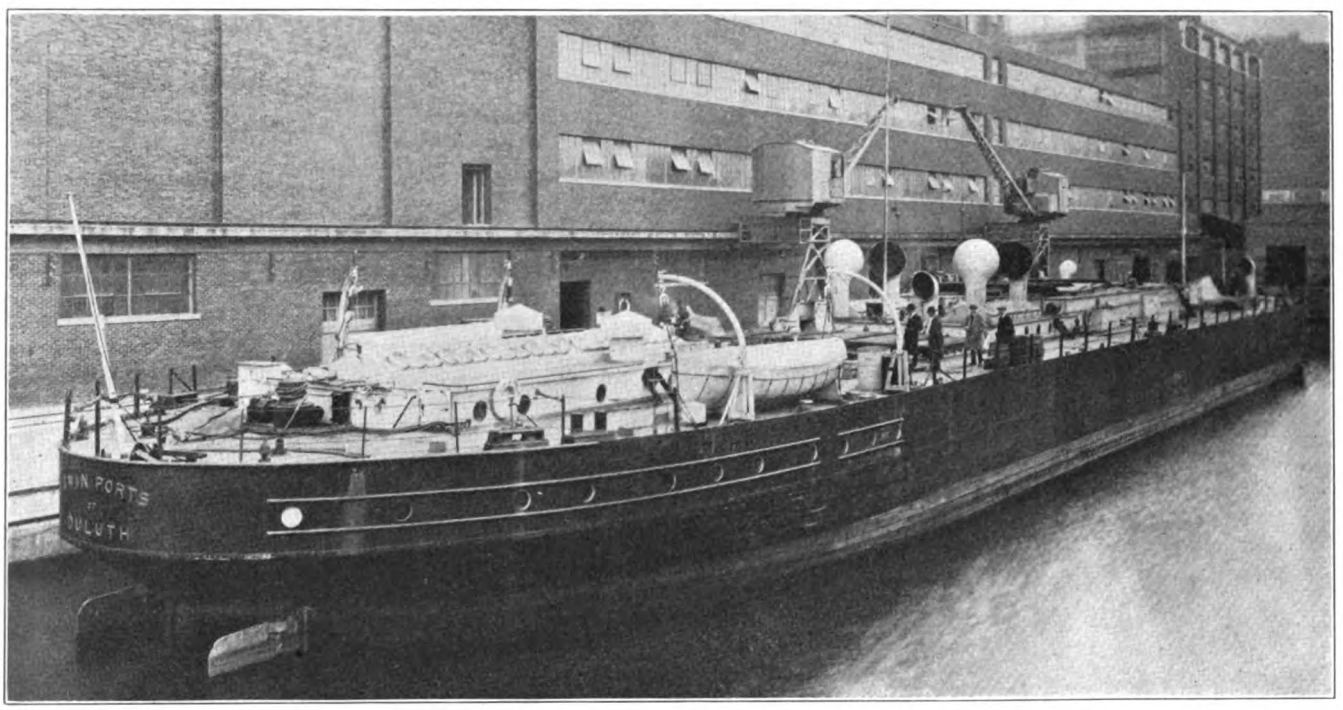
There are four cargo holds of which No. 2 and No. 3 are refrigerated and have a capacity for about 700 tons of dairy products. The engine room is located between No. 3 and No. 4 holds, the full width of the ship, and the refrigerating machinery, coils, brine tank, fans, etc., are housed in the superstructure. Accommodations are all below decks, forward and aft. The pilot house is located in the forward end of the superstructure.

Of necessity, everything higher than the top of the superstructure must be portable. The masts, which serve only to carry the statutory lights when outside the canal, are hinged; the ventilators are arranged to unship and the stack, which is merely an exhaust pipe arranged with a motor-operated lowering and elevating device controlled by a contact switch on deck, is also hinged and stows below the clearance line. The davits are hinged to stow on deck but the boats are below the clearance line.

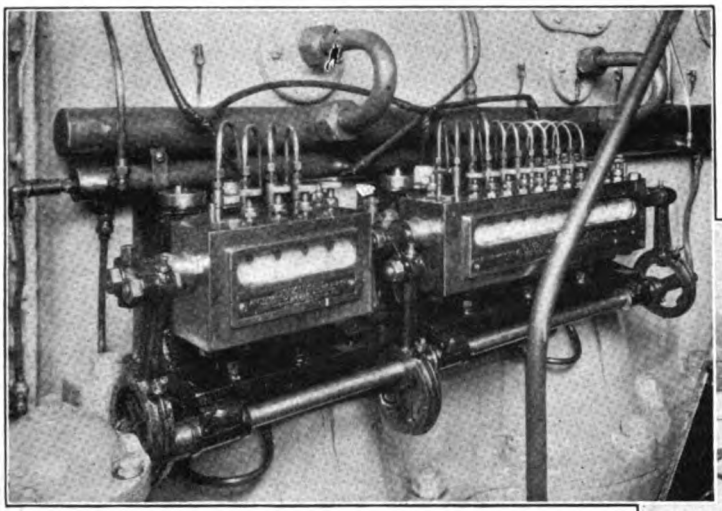
Probably the most interesting feature of the vessel is found in the power plant and in the reasons which determined its adoption, among which the problem of longitudinal distribution of weight and maintenance of trim was a leading factor. The use of oil fuel practically settled itself, leaving the choice between oil-fired steam and a diesel plant. The studies developed that with either, the weight must go well forward. With either, then, direct connection to the propellers involved two shaft alleys through the after hold with added weights and costs and loss of cubic and deadweight. The direct-connected diesel involved a very material loss of cubic by reason of the much greater length of engine room required. Steam increased the personnel, with added payroll and subsistence and accommodations. Smoke, even with oil-fired boilers, is not always avoidable, or at least its absence is not always secured. Weights, even with due consideration of the fuel consumption differences, favored the steam plant. The costs were altogether in its favor.

Consideration of diesel-electric drive indicated avoidance of shaft alleys; increased cubic from this source and ability to stow the units to best advantage regardless of shafting or other considerations; the opportunity of putting the speed control entirely in the hands of the pilot; avoidance of propeller racing in heavy weather; avoidance of smoke and reduction of personnel. Collateral advantages lay in flexibility of operation because of independence of units; thus both or either of the propellers can be operated when under reduced power, as in canal operation, with only one main generator. It follows that a breakdown of one main engine or generator would still, with the auxiliary set, leave the ship with nearly 75 per cent power available for propulsion, or well over three-fourths full sea speed. These features, it should be added, would also accrue with a steam-electric plant.

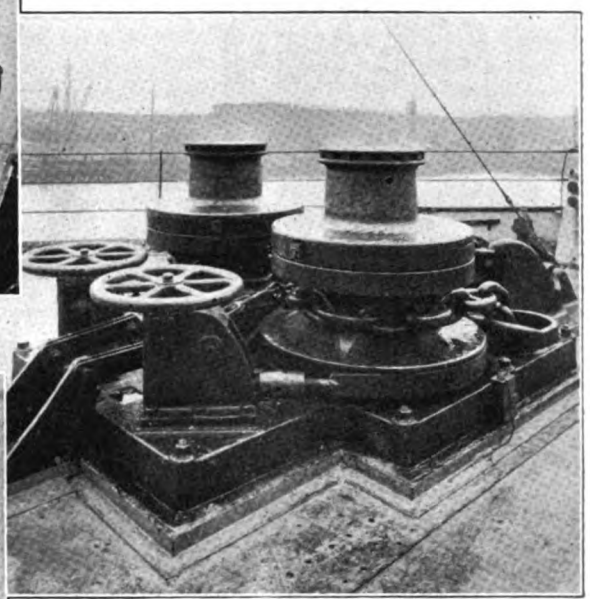
As offsets appeared somewhat increased weights and considerably increased costs with the subject of

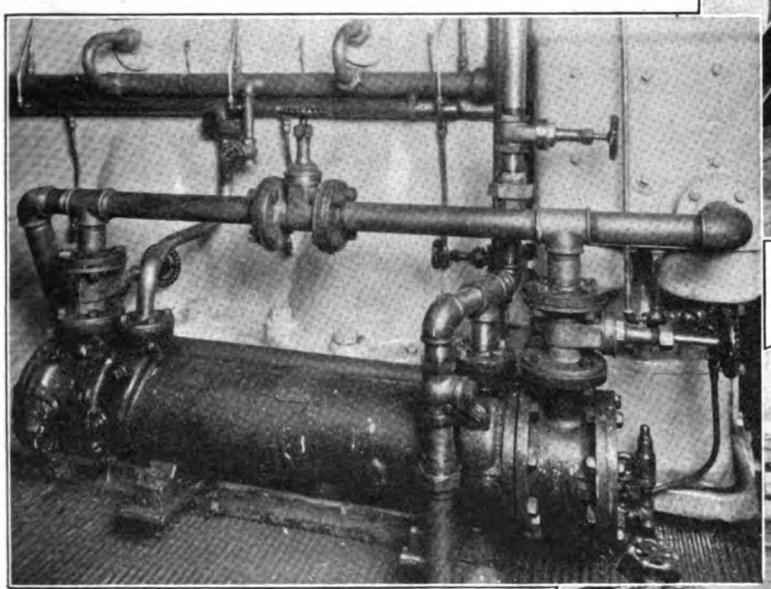


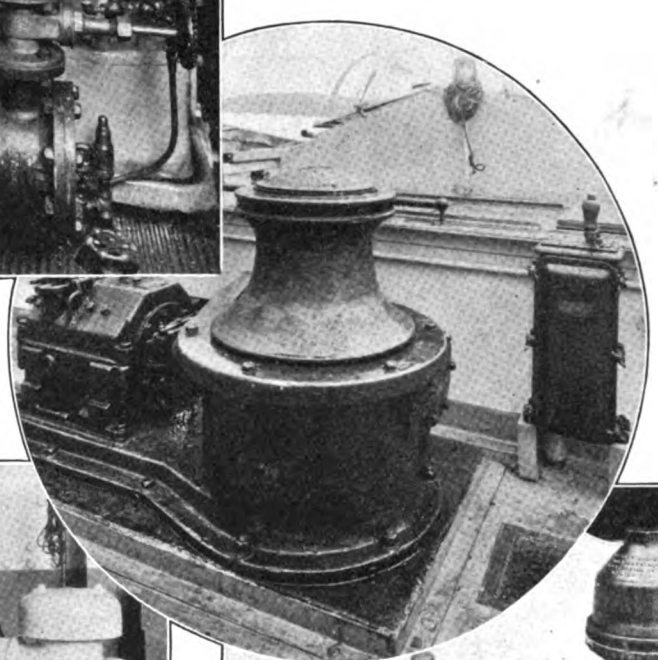
DIESEL-ELECTRIC DRIVE SUPPLEMENTED BY TWIN RUDDERS WAS USED TO OBTAIN HIGH MANEUVERING ABILITY. SHIP IS SHOWN AT McDOUGALL TERMINAL AT DULUTH



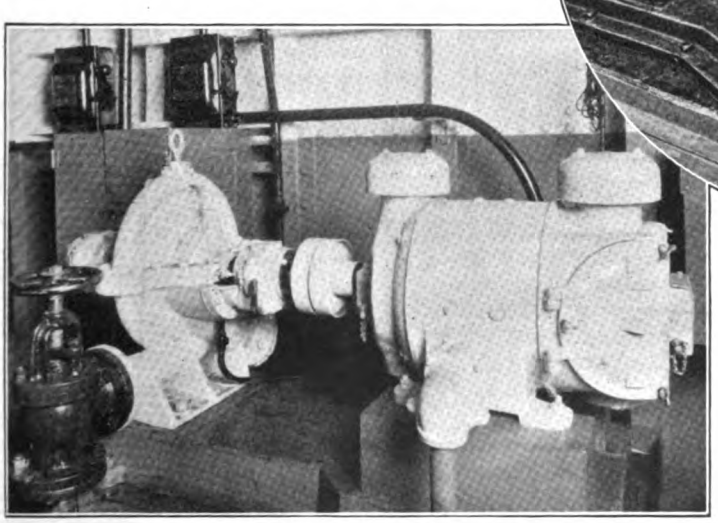
At left, sight feed oil pump, one attached to each main engine. Below, vertical anchor windlass

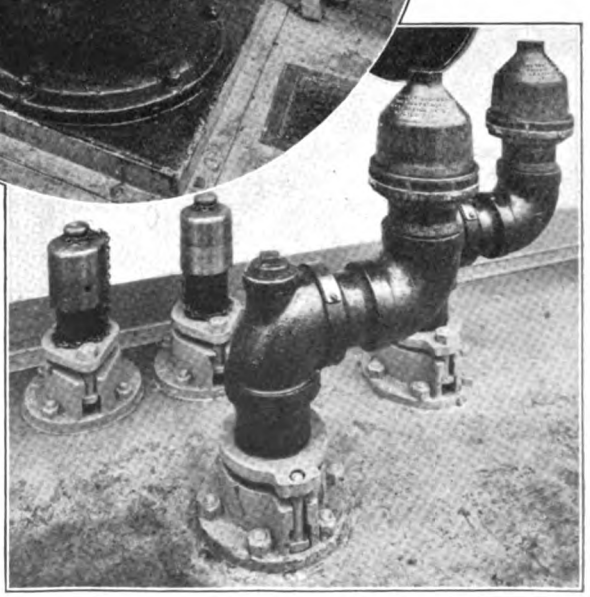




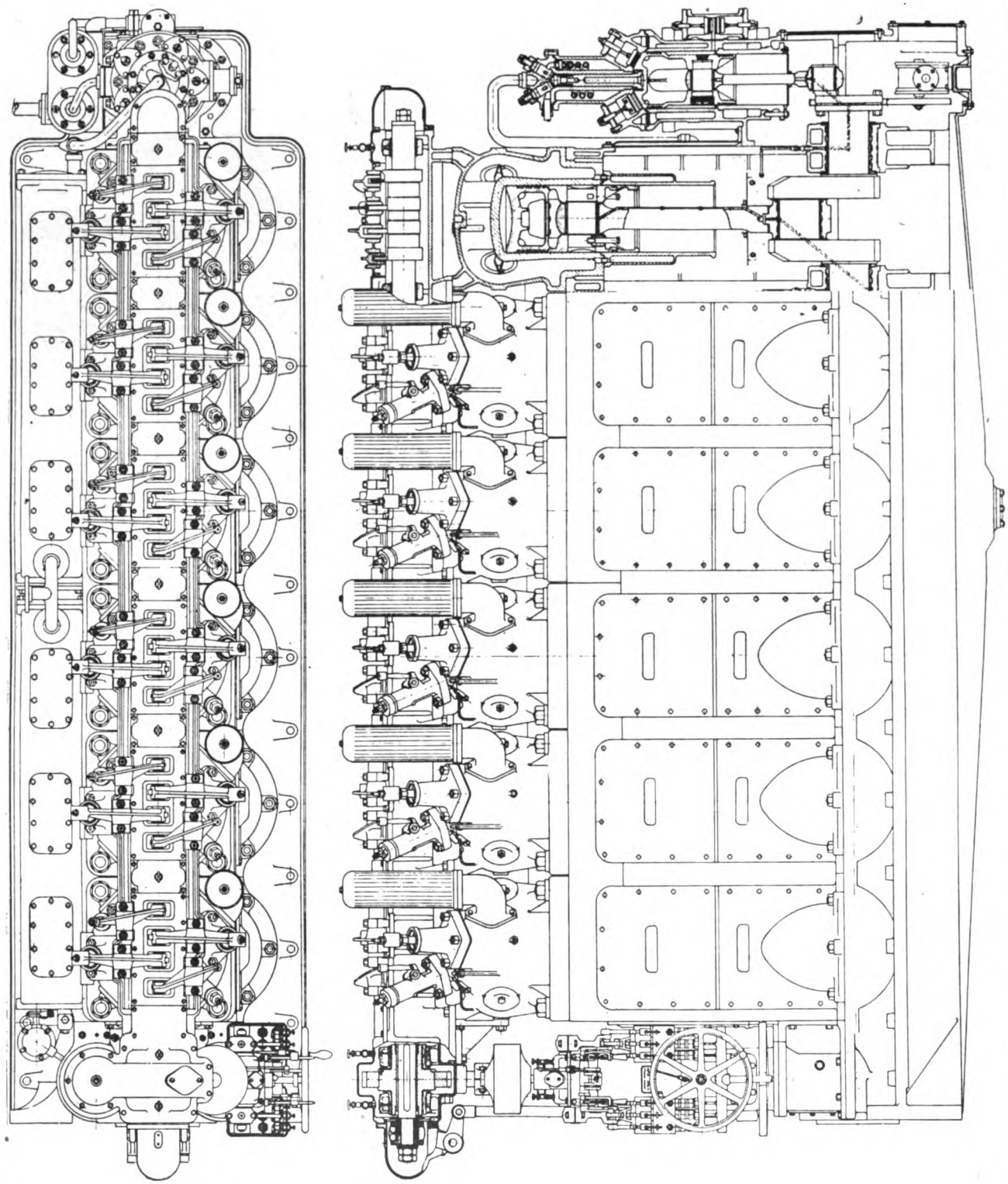


Above, lubricating oil cooler, similar unit on each engine. At right, capstan at after end of ship



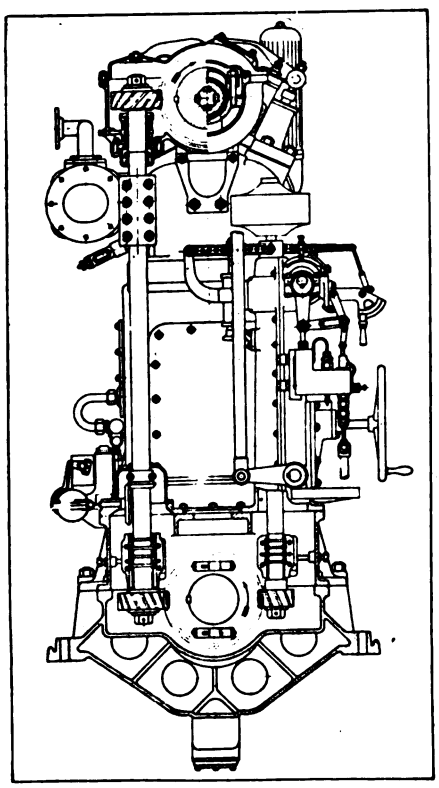


Above, circulating pump and at right, automatic tank vent valves which are used on all tanks. Fuel oil system also shown



ELEVATION AND PLAN OF ENGINE WITHOUT FLYWHEEL OR GENERATOR

maintenance in doubt. A survey of earning capacity seemed to favor the diesel-electric, though not at all overwhelmingly, assuming no particular advantage in handling in the canal. This feature, however, is certain to exercise a very great influence, not only in time but in avoidance of damage. In this particular, full cognizance was taken by the designer of the fact that no arrangement of power plant compares with the reciprocating steam engine with its infinite possible graduations as to propeller speeds with maximum torque available at any speed from zero to maximum and



SECTION—ELEVATION THROUGH GOVERNOR AND CAMSHAFT DRIVE

with its enormous overload capacity.

It is only fair, therefore, in summing up to say that neither the diesel nor the diesel-electric drive were adopted because of any enthusiasm for either but because the combination appeared best for the particular purpose. Further, it appeared that even in this respect, the choice as to types of engines was not wide, entirely aside from cost considerations.

The electric drive, however, made possible the use of standard stationary engine designs, since the requirements are merely those of any shore power plant under governor control with varying loads. Elimination of the reversing feature assists to offset the added weights and costs of the electric drive, whether with steam or diesel but particularly with the latter.

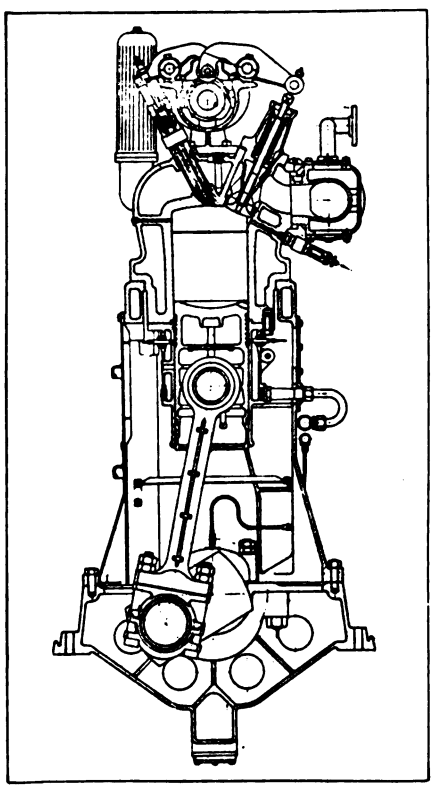
As installed, the power plant consists of two 6-cylinder, 375 brake horsepower, and one 2-cylinder, 60 brake horsepower, 4-cycle, air-injection, diesel engines, built by the Lombard Governor Co., Ashland, Mass. These are respectively direct-connected to 250-kilowatt and 40-kilowatt, 230-volt, direct current generators, all operating in parallel through common bus-bars. The propelling motors, which are direct-connected to the propeller shafts, are of 250 shaft horsepower each, and control is entirely rheostatic with constant voltage and with five speed steps in either direction. The generators, motors, controls and main switchboard are the product of the General Electric Co., Schenectady, N. Y.

Design of Engine

The general design of the Lombard main units is illustrated on pages 8 and 9. The prominent feature of this design lies in the arrangement of camshaft and valve levers which are entirely overhead and the absence of separate cylinder heads. The access to and removal of pistons is provided for through the removable doors at the front of the engine and by dropping the cylinder skirt, when the piston, connecting rod and skirt may be swung out to the floor. This operation is illustrated on page 3 from a photograph in the shops. Without any previous preparation one of these engines after a half-day run in the shop, was stopped, the door opposite one crank opened, the skirt dropped and the piston and rod swung out, the skirt removed and the piston and rings wiped and examined and the whole replaced and the engine started again in 29 minutes. This was done for the purpose of demonstrating the accessibility and convenience of the operation. At the same time one of the exhaust valves was removed and examined and replaced in about seven minutes.

The principal stresses of the engines are taken by steel tension members, the housing merely supporting the cylinders in place, and as these members can be withdrawn and the whole front of the engine removed without disturbing the housing proper, the whole interior, including the crankshaft can be removed without interference with the cylinders and valve gear. Lubrication is provided on the flood system by a rotary pump geared to the crankshaft end under the compressor. The latter is driven directly from the crankshaft and is of the 3-stage type on the main units and 2-stage on the auxiliary unit. In the whole design, accessibility has been kept prominently in mind throughout. H. Schreck, chief engineer of the Lombard company, is responsible for the design of the engines. He has been highly complimented on their successful operation.

Normally the two main units supply current for the propulsion motors and for the various auxiliary services. The 40-kilowatt auxiliary set is intended principally for port use. There is in addition a 5-kilowatt, 230-volt, Winton kerosene-engine-driven set, of which the principal use is to furnish current to operate a small, 22-cubic foot compressor for charging the air flasks after a lay-up or when for any reason they may have been discharged. The compressor is also a Winton type. The small gen-



TRANSVERSE SECTION THROUGH WORKING CYLINDER

erating set is connected to the bus-bars of the auxiliary switchboard and thus to the lighting system or any other purpose within its capacity.

Since no other source of heat or power exists aboard the ship, it follows that all functions must be electrically performed. The engine room auxiliaries, consisting of ballast, fire and general service, circulating, bilge, oil transfer and auxiliary lubricating oil pumps are motor driven. Motors are in general of the totally enclosed, variable speed type. In the motor room is a motor-driven 6000-cubic foot capacity fan for ventilating the propelling motors and resistors and a motor driven centrifugal bilge pump. Forward, there is a double vertical windlass and aft a dock type capstan, both motor driven and supplied by the American Engineering Co. Both of these are heavily powered

and are fitted also for hand operation, the latter merely for lay-up use. The steering gear is of the Hyde hydroelectric type, shaft-controlled from the pilot house. In this type of gear, the electric motor runs at constant speed and is coupled to a Waterbury hydraulic motor which works against the rams coupled to the twin rudders. Starting and stopping of the electric motor with each shift of wheel is thus avoided.

The accommodations are electrically heated and cooking, water heating, etc., are all done by electric appliances. Electric fans are fitted in each room, and in the galley and dining room.

The refrigerating plant includes two Brunswick-Kroeschell duplex motor driven ammonia compressors of 5-ton normal rating but speeded for 4-ton capacity. A duplex system of motor driven fans maintains air circulation from and to the refrigerated holds over a set of coils through which chilled brine is circulated. The air circulation is arranged for either concentration or distribution as to either or both holds. The entire plant can thus be concentrated on one hold as soon as loaded and while the other is filling. Similarly, distribution can be effected to suit character and condition of cargo. Maintenance of freezing temperatures is not contemplated. The same system is extended to cool the galley provision boxes and the drinking water.

Abundant water supplies have been provided for in view of off-shore work or detentions. The drinking water supply is sufficient for 25 days allowing a gallon per day per man while the ablutionary water tanks have a capacity up to about 80 tons. The drinking water will be from approved shore sources only and the supply is most carefully guarded against contamination or loss. Every opening to the tanks is under lock and key and the tanks themselves are carefully isolated from the hull. No water can be drawn from these tanks anywhere except in the galley and at the drinking fountain.

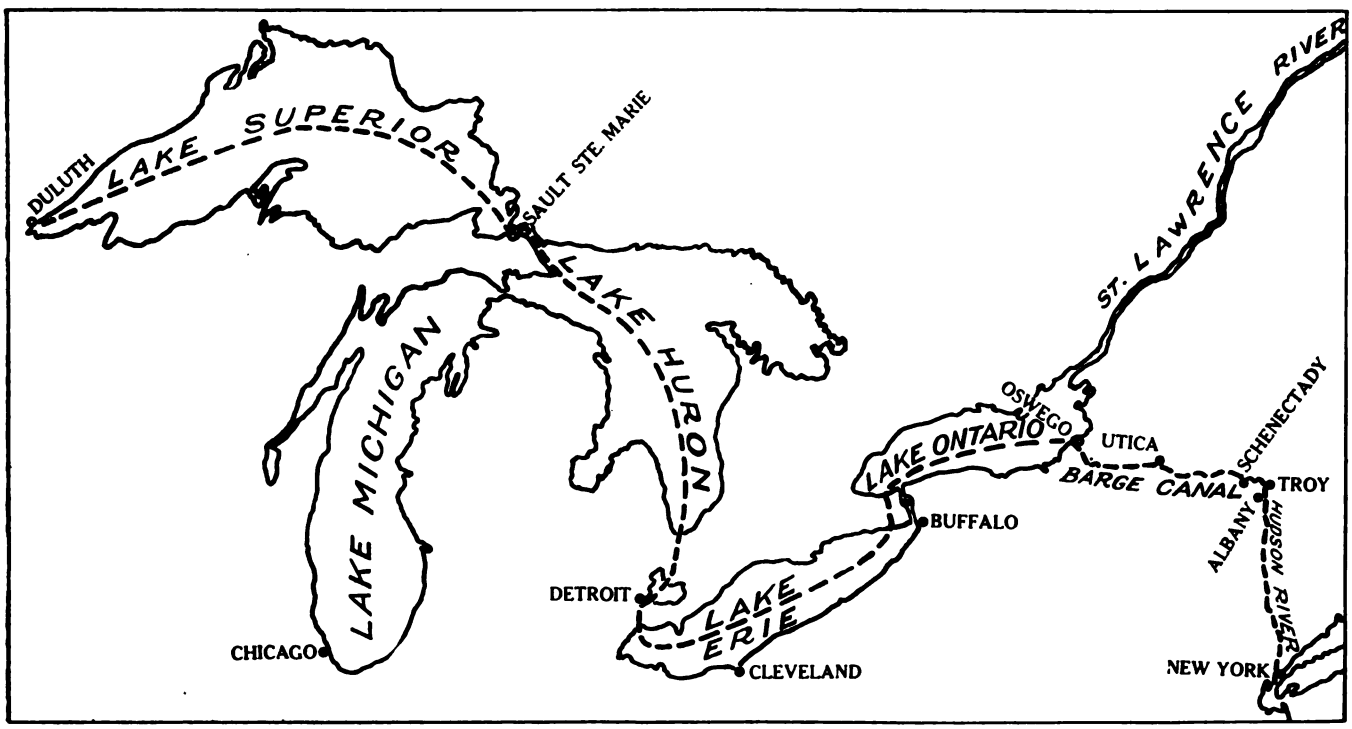
As the illustrations show, the pilot house is depressed below deck somewhat because of lack of headroom below the clearance line. The ship can be handled either from within the pilot house or, where visibility is deficient, as in the canal, from on deck, provision for steering from forward of pilot house, as well as an additional pair of controllers, being provided. Another pair of controllers is located on deck aft for use in emergency or in working about terminals.

Some of the other features found in these ships are worthy of mention. For instance, the layout of the entire installation is notable for the complete accessibility of every part, particularly in the engine and motor rooms. The equipment has been stowed in a convenient and roomy manner yet without any waste of space. Not a stanchion is used in the engine room, the entire grating being suspended from above. All piping, while easily got at, is kept out of the way.

The layout of the pumping and filling systems is unusually complete. The ballast pumping and filling systems are isolated from each other and from bilge and oil handling systems. There is no possibility of simultaneous communication between either bilge, ballast or oil pumping or filling lines. A separate manifold is provided for each function with interlocking connections. For instance No. 1 and No. 4 double bottoms are designed for cargo oil which can be handled overboard by the ballast pump but there is no provision for getting either water or oil into these tanks except by filling from on deck. When pumping from these tanks, no communication can be established with or from any other source. No. 2 tank can be filled either by gravity or by pump from the sea only but not by both at the same time and no other service can be cut in at the same time. No communication is provided between bilge suction manifolds and any water or oil connection so that neither can possibly enter bilges except through damage or by deliberate action. A sea connection and a suction line can not be in communication at any time. No connection is found anywhere between any oil line, either fuel or lubricating, and water lines. There is no possibility of connecting fuel and lubricating oil lines; the systems are entirely distinct.

Because of the uniformly low temperature of Lake Superior water and its refrigerating effect on cargo oil, the Row & Davis system of handling cargo oil has been fitted in Nos. 1 and 4 tanks. The oil carried westward in these tanks is used as fuel under the boilers of the terminal at Duluth.

Control of the bilge water in the motor room has called for extreme care because of its remoteness from the engine room and the fact that the room is only visited at stated intervals.



ROUTE FOLLOWED IN CARRYING REFRIGERATED AND GENERAL CARGO BETWEEN DULUTH AND NEW YORK

A float at the lowest point closes a 230-volt circuit which includes a gong in the engine room. A similar float automatically starts the centrifugal self-priming bilge pump before referred to by tripping a switch. This pump can also be manually controlled. The ballast pump in the engine room also of course has a suction to this space.

Kingsbury thrust bearings are fitted to the propeller shafts and to outboard bearings of the main engine and generator shafts. The latter arises out of the somewhat startling, because unusual, athwartship setting of the principal units, and consequent thrust stresses due to heeling of the vessel and the weights of the flywheels and armatures and the desirability of avoiding any axial strains on the crankshafts.

The athwartship setting of the engines reduces the engine room length about 6 feet and thus adds about 4000 cubic feet of cargo space but also distributes the engine and generator weights and stresses over five longitudinals besides the center keelson and carries the strains well forward and aft of the engine room. It contributes also to a better arrangement of auxiliaries and piping.

Maxim silencers are fitted in the exhaust lines from all engines which are then led to the stack. Even with all engines in service the muffling is almost perfect at all rates of working.

Develop Revolution Counter

Because of the fact that the propellers are handled entirely from the pilot house or deck, the engines run always at constant speed and the engine room force has no knowledge of the vessel's movements, and no record of propeller revolutions is kept in the ordinary way, in fact the engine room log only records preparation for departure and the stoppage of engines. It thus became necessary to devise some other method of logging revolutions. Coupling a counter to the propeller motors would have been easy but as both engine room and pilot house are remote from the motor room and the record of revolutions is of service to the master only as a check on dead reckoning it appeared advisable to find some way of transmitting the count to the pilot house.

A solution was worked out by H. E. Warren, of the Warren Clock Co., Ashland, Mass., who designed the synchronous clock system employed in connection with central station working, and what is probably the first remote synchronous counter is the result. In this device, a small motor coupled to the worm shaft of an ordinary engine counter is operated on a circuit which is interrupted a certain number of times in each revolution of the propelling motor, the counter motor moving in synchronism at all speeds whether fast or slow and establishes the record of actual revolutions per unit of time. The counter is located in the pilot house where the watch officer may note the count at any time, and thus has the same check on dead reckoning as though the engines were directly connected to the propeller and recorded in the engine room in the usual way.

Protection Against Fire

The Lux type carbon-dioxide fire extinguishing system is fitted throughout the ship. In this system, the gas is stored in steel flasks which are connected together and led to the central distribution cabinet in the pilot house and from which its discharge to the different holds is controlled. The flasks are stowed in a compartment in the superstructure immediately behind the pilot house. One of the advantages of carbon-dioxide as an extinguisher lies in the fact that its use is harmless as to cargo and with dairy products forming so large an item in the trade, this feature is of great importance in restricting losses.

The trials of these vessels aroused great interest among shipping people and among those who took advantage of the opportunity were Frank E. Kirby; Prof. H. C. Sadler, of the University of Michigan; H. N. Herriman, Great Lakes manager of the American bureau of shipping; George B. Turnbull, vice president and chief engineer of the Great Lakes Engineering Works; J. C. Workman, chief engineer of the American Shipbuilding Co.; H. Schreck, chief engineer of the Lombard Governor Co.; Capt. R. W. England, manager of the Interstate Steamship Co.; R. Parry Jones, London Salvage association; R. V. Sawhill, editor, MARINE REVIEW; Capt. N. B. Nelson, supervising inspector, and Capt. T. W. Gould and S. H. Hunter, local inspectors, steamboat inspection service; A. Kennedy Jr., T. S. Gandy, R. O. Dunham and F. L. A. Schmidt, of the General Electric Co. and others. In both instances the ships were run over the same course from Ashtabula to Cleveland, 56 miles, and in each case there was not a stop nor the slightest difficulty of any kind, every detail of the equipment functioning perfectly. Good workmanship and effective planning and supervision are strikingly apparent in every detail.

That in an undertaking of this kind where so much new ground has had to be broken, no detail will be found which may require modification after further experience is hardly to be looked for, but that both owner and designer exhibit courage and confidence will be denied by none and the performance of the initial vessels of the fleet will be watched with interest.

Late Marine Patents

Copies of any one of these patents can be secured by forwarding 25 cents in stamps to Siggers & Siggers, patent attorneys, National Union building, Washington, and mentioning MARINE REVIEW:

1469624—Leak-closing device for ships. Jorge Espinosa De Los Monteros, Madrid, Spain.

1470598—Pillow, marine life-saving belt and the like. Morland Micholl Dessau, London, England.

1470693—Combined cover and spout for vessels. James E. Meed, Palestine, W. Va.

1470865—Boat-propelling device. Andrew J. Nelson and Elmer M. Nelson, St. Paul.

1470908—Life preserver. John Catanzaro, Framingham, Mass.

1470978—Pouring spout for vessels. William C. Helcher, Akron, O.

1470983—Lifeboat. Nellie F. Jayne, Brooklyn, N. Y.

1471547—Production of submarine signals and the location of submarine objects. Constantin Chilowsky and Paul Langevin, Paris, France.

1471552—Releasing device for lifeboats and other similar craft. Richard Corey Edwards, Oakland, Cal.

1471628—Submarine mine. Wayne F. Palmer, Washington.

1471870—Ship propelling device. Gustav Tust, San Francisco, Cal.

1471896—Propeller for vessels. Baptiste Icre, New York.

1471935—Machine for the cleansing of the bottoms and sides of floating ships. Hjalmar Arentz, Hellerup, Denmark.

Sales of U. S. Vessels

YUCCA, ex-enemy cargo, 4360 deadweight tons, 2777 gross tons, built in 1903. Bought by the Equity Steamship Co., 11 Broadway, New York. This sale was made as the result of the auction held on Oct. 29, 1923.

SAPONA, concrete cargo ship, 3704 deadweight tons, 2795 gross tons, purchased by Carl G. Fisher, Port Washington, Long Island, N. Y.

Em-fle-co, steel launch, length 24 feet 2 inches, 10 horsepower, purchased by Martin Olsen, Westport, Oreg.

Capt. Eugene E. O'Donnell, of C. H. Sprague & Son, Boston, has been made chairman of the committee appointed by President A. G. Smith of the American Steamship Owners association to prepare a thorough revision of the navigation laws and rules of the United States.

General agent C. H. Weeks of the Coastal Steamship Corp., operating a semiweekly freight service between Boston and New York, has announced the appointment of Chester A. Coburn as commercial agent.

Leviathan Sets New Westward Record

On her arrival in New York on Nov. 26, the LEVIATHAN became the holder of the record for the fastest westward transatlantic voyage. The LEVIATHAN'S time on this record run was 5 days, 7 hours and 20 minutes. This is 13 minutes less than the best previous record westward, the MAURETANIA of the Cunard line, in October, 1922, making the run in 5 days, seven hours and 33 minutes. The LEVIATHAN sailed for Europe Dec. 1, and is expected back in New York on Dec. 21. On her arrival in New York, she will be laid up for a thorough general overhauling. At this time, she will also be drydocked in the commonwealth dock in Boston. Some time ago, trouble was experienced with the backing turbines and an opportunity will present itself during this regular lay-up for making permanent repairs to these turbines. The present condition of her turbines in no way interferes with her performance as is evidenced by the fact that on her westward voyage in the latter part of November, she broke the record.

At the time of her general overhauling which will probably be largely executed at Hoboken, N. J., she will receive the general tuning up which is always necessary for a new ship, after a certain preliminary period of operation. The LEVIATHAN will be ready to reenter the transatlantic service in March, or a time which will insure an appropriate share of the new season's travel. Her record in five months of service has been satisfactory.

Ocean Freight Rates

Per 100 Pounds Unless Otherwise Stated

Quotations Corrected to Dec. 7, 1923, on Future Loadings

New York to	Grain	Provisions	Cotton (H. D.)	Flour	General cargo cu. ft.	General cargo 100 lbs.	††Finished steel
Liverpool	3s 3d	$0.40	$0.25	$0.19	$0.30	$0.60	$7.00T
London	3s 3d	0.40	0.25	0.19	0.30	0.60	7.00T
Christiania	$0.19	0.40	0.40	0.23	0.42½	0.85	8.00T
Copenhagen	0.19	0.40	0.40	0.23	0.42½	0.85	8.00T
Hamburg	0.15	0.35	0.27½	0.22	0.37½	0.75	8.00T
Bremen	0.12	0.33	0.25	0.17	0.37½	0.75	8.00T
Rotterdam	0.16	0.32½	0.25	0.21	0.35	0.70	7.50T
Antwerp	0.15	0.32½	0.25	0.20	0.35	0.70	7.00T
Havre	0.16	0.40	0.22½	0.25	0.40	0.75	8.00T
Bordeaux	0.16	0.40	0.22½	0.25	0.40	0.75	8.00T
Barcelona	0.25	12.00T	0.40	10.00T	—12.00T—		10.00T
Lisbon	0.20	0.65	0.40	7.00T	—20.00T—		7.00T
Marseilles	0.17	0.55	0.50	5.60T	—20.00T—		5.00T
Genoa	0.17½	0.50	0.35	0.30	0.40	0.80	6.00T
Naples	0.17½	0.50	0.35	0.30	0.40	0.80	6.00T
Constantinople	0.23	15.00T	0.75	0.35	—20.00T—		8.00T
Alexandria	0.25	15.00T	0.75	0.30	—20.00T—		8.00T
Algiers	0.20	0.75	0.75	0.30	—20.00T—		7.00T
Dakar	.....	14.50T	.....	13.00T	—20.00T—		10.00T
Capetown	6.00T	10.00T	.....	7.50T	—10.00T—		8.00T
Buenos Aires	.....	18.00 to 20.00T	.....	.....	18.00 to 20.00T†		7.00 to 7.70T
Rio de Janeiro	.....	19.00 to 21.00T	.....	7.00 to 7.70T	19.00 to 21.00T†		6.00 to 6.60T†
Pernambuco	.....	22.00T	.....	9.00T	—22.00T—†		10.00T†
Havana	0.17½ to 0.22½*	0.37½*	.....	0.17½*	0.47*	0.94*	0.20*
Vera Cruz	0.25	0.30	0.35	0.25	0.52½	1.05	0.30
Valparaiso	.....	1.07	.....	0.70	0.45	0.80	12.00T
San Francisco	.....	0.40 to 0.70	.....	0.70 to 1.00	.....	2.50	0.55 to 1.00
Sydney	.....	18.00T	2.50	18.00T	18.00-24.00		9.00-12.00T
Calcutta	.....	16.00T	0.65	15.00T	—16.00T—		10.00T

T—Ton. †Landed. ††Heavy products limited in length. *Extra charge for wharfage.

From North Pacific Ports to	Lumber Per m. ft.
San Francisco	$6.00 to 6.50
South California	6.50 to 7.50
Hawaiian Islands	10.00 to 10.50
New Zealand	15.00 to 16.00
Sydney	15.00 to 16.00
Melbourne-Adelaide	15.00 to 17.00
Oriental Ports	14.00 to 17.00
Oriental Ports (logs)	22.00 to 23.00
Peru-Chile	13.00 to 15.00
South Africa	19.00 to 20.00
Cuba	11.00 to 14.00
United Kingdom	80s to 90s
United Kingdom (ties)	70s to 80s
Baltimore-Boston range	$11.00 to 13.00
Baltimore-Boston range (ties)	Not quoted
Buenos Aires	14.00
Flour and Wheat	
Oriental Ports (net ton)	$ 6.25 to 7.00
U. K. and Continent (gross ton)	35s to 37s 6d
General Merchandise	
Oriental ports	$10.00
Steel	
Oriental Ports	$5.00T to 7.00T
Cotton	
Oriental Ports	35c to 50c per cwt
Apples	
United Kingdom	90 cents per box
Copper	
Oriental Ports	$5.00
Box Shooks	
Oriental Ports	$10 measurement ton
Metal Junk	
Oriental Ports	$10.00
Scrap Copper	
Oriental Ports	$5.00
Salt Herring	
Oriental Ports	$8 measurement ton
Machinery	
Oriental Ports	$7.00
Automobiles	
Oriental ports	$8.00

Principal Rates To and From United Kingdom

	s	d
Grain, River Plate to United Kingdom	23	3
Coal, South Wales to Near East	10	0
Coal, United Kingdom to Hamburg	5	3
Pig iron, or ferromanganese, United Kingdom to New York or Philadelphia	15	0
Iron ore, Bilbao to Middlesbrough	7	6
Iron ore, North Africa to Philadelphia	7	0

Bunker Prices

At New York

	Coal alongside per ton	Fuel oil alongside per barrel	Diesel oil alongside per gallon
Oct. 13, 1922	$8.55	$1.45	5.50 cents
Jan. 11, 1923	7.90	1.50	4.75 cents
April 11	6.75@7.50	1.76½	5.10@5.35c
July 11	5.50@7.00	1.76½	4.40@5.50c
Oct. 11	5.25@6.85	1.51½	4.00@4.50c
Nov. 10	5.25@6.50	1.51½	4.00@4.50c
Dec. 7	5.25@6.50	1.41½	4.00@4.50c

At Philadelphia

	Coal alongside per ton	Fuel oil alongside per barrel	Diesel oil alongside per gallon
Oct. 13, 1922	$8.30	$1.47	5.00 cents
Jan. 9, 1923	7.30@8.00	1.57½	5.00 cents
April 10	6.00@6.50	1.875	5.10 cents
July 9	5.25@6.25	1.62 @1.73	4.35@4.60c
Oct. 11	5.00@5.50	1.36½@1.51	4.12@4.36c
Nov. 10	5.00@5.50	1.36½@1.51	4.00@4.25c
Dec. 7	4.90@5.50	1.36½@1.41	3.85@4.37c

Other Ports

Boston coal, per ton	$7.21
Boston, oil, f. a. s., per barrel	$1.42
Hampton Roads, coal, per ton t.i.b.	5.50@5.70
Cardiff, coal, per ton	18s
London, coal per ton	25s
Antwerp, coal per ton	25s

Capacity Up Tenfold in Ten Years

American Marine Insurance Market Can Write Much More Business Now Than in 1912—Tanker Rates Are Discussed

WILLIAM H. McGEE, president of the marine underwriters agency which bears his name, has made an analysis of underwriting conditions and the results of his study are interesting and authoritative. Underwriting results for 1922 were generally good for the reason that there were few big losses, whereas as 1923 has had its share of serious casualties and what may prove a catastrophe in Japan, he says. Mr. McGee states:

"The underwriting capacity of the New York market, which is the fair measure of the whole American market, even after the retirement during the last three years of a considerable number of companies as well as the closing of a number of underwriting offices is still something like 10 times its capacity of 10 years ago. Under American practice, the insurance of automobiles is classed as 'marine business,' consequently the statistics of 10 years ago, which show large 'marine' business included transactions of companies which never wrote a real marine risk, and included automobile insurances by those who wrote automobile as well as ocean marine. Therefore, a comparison of 1922 with 1912 is difficult, and can not be altogether reliable. Insurance department requirements now separate automobile and 'side lines' from ocean marine.

"Something like 49 companies licensed in New York to transact 'marine' business in 1912, and a small number not so licensed, reported a gross marine premium for the whole of the United States of $25,000,000. In 1922, one hundred companies reported a gross ocean marine premium income of something under $40,000,000. Double the number of companies underwritten for in substantially the same number of offices, most all of whom have largely increased their individual carrying capacities, wrote about 50 per cent more premium income in 1922 than was written in 1912.

"The character of business now offered shows steady improvement, and there seems to be some increase in the size of units, but the number of units is reduced. Few risks are offered, but fortunately there is less rubbish. As to hull insurances, and, for that matter, any other business, the one hopeful sign comes from London. The recent agreement as to the renewals, if supported can have only a beneficial effect upon the American market, but much more must be done if any real and lasting good is to be accomplished. And it remains to be seen whether underwriters in America, who are letting their business leave them on what they deemed perilous values and seriously inadequate rates, will be willing to assist others without having co-operation or seeing benefits for themselves. Without a doubt they are in a majority, sympathetically inclined toward any movement for a betterment.

"The low rates at which tankers have been written is a mystery which has long given rise to much discussion, and can not be understood in New York. In view of the loss experienced thereon, and the greater cost of repairs than on cargo boats generally, leading underwriters in New York are convinced that a tanker's value should be greater, ton for a ton than a cargo boat, and the rate of premium higher. Overloading, too, must be taken into consideration in these vessels. Loadline markings, where there are any, have not had much influence upon loadings. The Panama canal authorities made strong comment upon the overladen condition of tankers passing through the canal, and of the trouble and damage which such vessels have caused.

"The American marine insurance syndicates continue to give a good account of themselves. Although voluntarily doing a smaller volume of business there is no delusion on their part, however, over their balance-sheets.

"In the present underfed state of this market those who seek more present income, those who desire to maintain stability, and those who are trying to search the future—each have difficult problems to face."

* * *

Commission Throws Out War Claims

CLAIMS aggregating $345,000,000, brought to recover insurance premiums paid by Americans for protection against war hazards have been disallowed by the mixed claims commission in session at Washington. LUSITANIA claims, numbering 278, were upheld but war insurance recovery was denied. The commission took the position that war risk insurance did not constitute a class for which Germany is financially responsible. The ruling of the commission with respect to war insurance claims reads:

"In the group of claims there is no complaint of injury to or destruction or seizure of property by the acts of Germany or her agents. The sole complaint is that the hazards of the war required the claimants as a matter of business prudence to protect by insurance risks which never matured into damage. Under the terms of the treaty of Berlin, Germany can not be held liable for all losses incident to the very existence of the state of war. To this class belongs claims of American nationals for the refund of premiums paid by them for insurance against the risk of possible losses which never occurred, risks in their very nature uncertain, indefinite, indeterminable and too remote to furnish a solid basis on which to rest a claim."

* * *

Propose Plan to Aid U. S. Insurance Firms

A RECOMMENDATION proposed by Samuel D. McComb, chairman of the committee on marine insurance of the American Marine congress at the annual meeting of that body held in New York recently provided for the passage of an adequate loadline law. The resolution was adopted. It provides that American vessels be classified in the American bureau of shipping; loading of cargo be inspected by the board of underwriters; a loading certificate be obtained in the case of vessels engaged in overseas trade; that the vessels be insured in the American marine insurance syndicates, and that in the event of any loss or damage the services of the association be immediately utilized. The text of the report submitted by Mr. McComb follows:

"We recommend that the services of the United States Salvage association be inquired into by all American shipowners and that they subscribe to them.

"We recommend using the facilities of Syndicate "C" to the fullest extent by American shipowners. Today the American shipowner or operator is appealing to the American public for support; the object of this congress is to help them.

"It is recommended that steamers be loaded under the supervision of the board of underwriters and their certificates be obtained at all sailings. The certificate is *pima facie* evidence that the loading was properly done and the presence of the board's representative will assure the operators that proper requirements have been observed. This will undoubtedly tend to reduce the

complaints on the score of improper loading.

"In order to carry out the foregoing, it is urged that congress be petitioned to enact legislation which will provide an official loadline for American vessels engaged in foreign trade, coupled with such reciprocal provisions that American shipowners will not be subject to the possibility of embarrassing and costly regulations concerning loadlines which have been or may be adopted by foreign governments. In domestic service proper loadline should be determined and adhered to so that life and property may be safeguarded from the dangers of overloading. We believe that a closer co-operation between steamship companies and their underwriters would be greatly to the interests of all concerned and we strongly recommend this course.

"If a steamer is damaged or breaks down, the cost of repairs may be paid for in full by the underwriters, but no insurance can make up for the loss of satisfied customers. Delayed deliveries occurring with any frequency will seriously injure, if not ruin, any steamship company."

* * *

Great Lakes Business Has Good Year

EVERYTHING considered, marine insurance companies have had a good season so far as their Great Lakes business is concerned and their books generally will show a satisfactory profit on their underwriting transactions unless something at present unforeseen happens. The loss ratio is lower than it has been in the past and premium volume has been well maintained, most of the companies report.

Vessel owners have been advised, however, that an additional rate of three quarters per cent will be charged if owners tie up their boats for the winter inside the Buffalo harbor wall unless along side of slips or wharves or inside the Buffalo river. The reason for the additional premium says the announcement, is that vessels tied up at the wall are frequently torn away and drive against each other in bad weather.

* * *

Death of Two Prominent Underwriters

TWO of the most prominent marine insurance underwriters in the United States died during the past month. Clayton Platt, senior member of the firm of Platt, Fuller & Co., died at the age of 72. Walter D. Despard, president of the Union-Hispano Insurance Co. and prominent in brokerage circles died in New York. He had been inactive in business for several months.

Pacific Lumber Rates Are Lower

INSURANCE rates on coastwise lumber on the Pacific coast have declined despite the fact that the business has not been profitable, it is reported by coast insurance firms. A few months ago this business was being written at around three-eighths of 1 per cent, whereas lately a considerable volume of business has been accepted at three-tenths of 1 per cent. The minimum rate is being shunned by a few offices because they are unwilling to write business at a rate which they believe to be inadequate but a sufficient number are quoting minimum rates to take care of the business. Conditions are being aggravated by the drop in coasting rates in the face of numerous casualties and the fact that Oriental rates are weaker since the Japanese earthquake. Rates of 30 cents for under deck and 60 cents on deck are being quoted during the winter, which is looked upon as one of the worst risks in Pacific commerce.

* * *

Propose to Limit Risks On Marine Policies

PRELIMINARY steps toward the improvement of terms and conditions of cargo insurance were made at a series of meetings of representatives of Lloyds Underwriting associations in London. Among the questions that have been under consideration are the desirability of limiting the risks covered by the marine insurance policy to those perils of the sea which it is intended to cover. Lately, the cover of the marine insurance policy has been extended to cover many contingencies which are not perils at all, and some which are so inevitable that by accepting liability for them the underwriter also accepts the certainty of a claim.

* * *

Experts Try To Find Out Jap Quake Loss

AS WAS anticipated, Japanese insurance companies have been ordered to pay a share toward the rebuilding of Japan, although under the terms of their policies they were not liable to loss brought about by such an unforeseen catastrophe as an earthquake. The Japanese government is reported to have ordered the companies to pay on the basis of 10 per cent of the insurance values. The imperial Japanese government has agreed to furnish the money where needed upon long term, low rate loans. Although several months have passed, so far nothing authentic has been heard regarding the extent to which marine insurance companies have been affected. American and British experts are now on the spot and it is expected that reliable information will be received from them in the near future.

* * *

Black Sea Has Floating Mine Hazard

THE hazard of floating mines is still existent it was revealed recently at a meeting in Austria of the International Marine Insurance union at which the seriousness of the situation in the Black Sea was discussed and a decision reached to impose an additional premium of ¼ per cent per voyage for mine risks for trips in those waters. It was reported at the meeting that losses occasioned by floating mines have resulted in a number of casualties. At the meeting it was also decided to retain the international river Plate clause instead of granting concessions in writing risks for the river Plate region.

Reopen Repair Plant

Work is to be resumed on Dec. 15 at the Harlan plant, Wilmington, Del., of the Bethlehem Shipbuilding Corp. The plant is now in a position to handle general ship repair work. The drydock will take ships up to 345 feet in length with a maximum draft of 12 feet.

SIDNEY J. JACKSON, manager the International Mercantile Marine Co., at Boston has been elected a vice president of the Traffic Club of New England. T. L. STUART, New England agent of the Great Lakes Transit Corp. has been re-elected secretary-treasurer. Among the new directors of the club are EDWARD M. HAGARTY, freight traffic manager of the Cunard Steamship Co., CAPT. E. G. O'DONNELL, manager of the marine department of C. H. Sprague & Son.

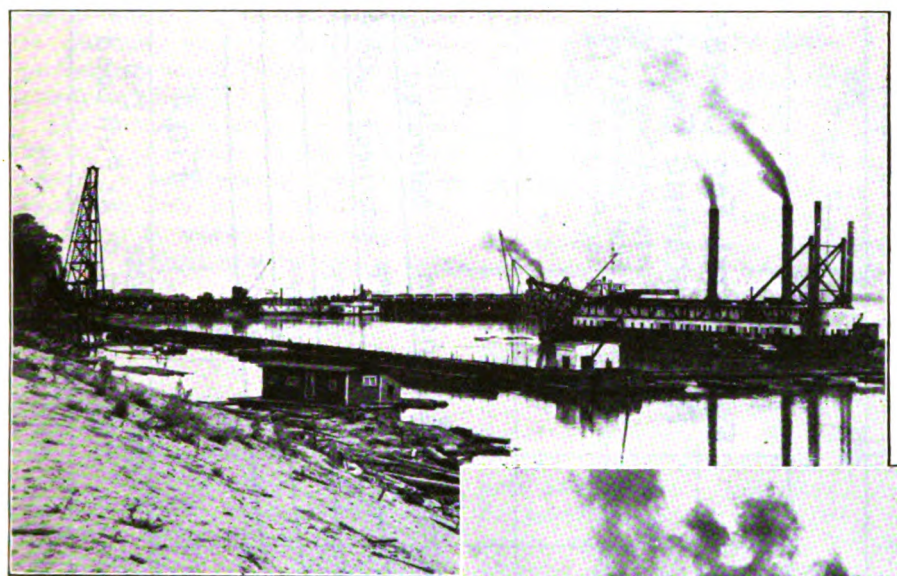
SIDNEY BOULTON has been elected an honorary member of Lloyds. There are very few other honorary members, including such men as LORD BEATTY and LORD HAIG. Mr. Boulton was chairman of Lloyds in 1920 and 1921. He has been connected with the famous British marine insurance organization since 1869. He became an underwriting member of Lloyds in 1889 and was first elected to serve on the committee in 1902.

A huge graving dock is nearing completion at Congella, Durban, South Africa. The effective length is 1150 feet and the maximum width 138 feet 6 inches. The dock can handle the largest vessel afloat and will be one of the most effective repairing basins in the southern hemisphere.

Start Docks at New Pacific Port

Large docks are now being built on the Columbia river, at the new industrial city of Longview, Wash. The dock section will be one of the largest undertakings on the Longview project, for the city, located about 50 miles from the Pacific ocean, is expected to become one of the important ports on the Pacific coast.

The program calls for the ultimate construction of three export docks, each with a berthing length of 1800 feet and each 350 feet in width.



BUILDING NEW DOCKS ON COLUMBIA RIVER AT NEW CITY OF LONGVIEW, WASH. THIRTY-INCH SUCTION DREDGE IS PUMPING SAND FILLS AND PILE DRIVER IS AT WORK

The first unit, now under construction, which will serve the west fir unit of the Long-Bell Lumber Co.'s lumber manufacturing plants, is rising rapidly. It is designed to carry 1000 pounds per square foot. The dock will have both shipside and inshore railroad tracks.

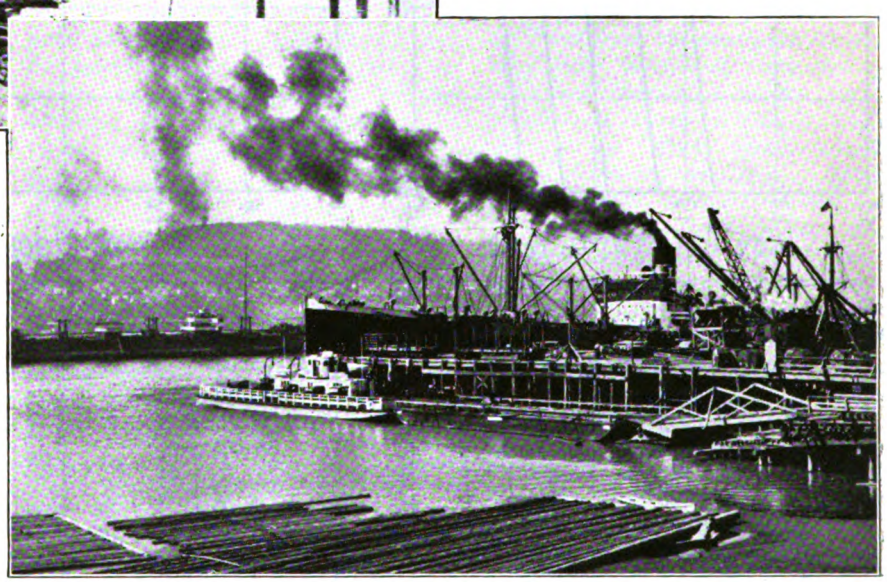
Lumber will be handled on the docks entirely by electricity. Traveling hammerhead electric cranes, 50 feet in height having a working radius of 100 feet, will handle all the lumber as it is received from the mills and will also serve the ocean vessels moored at the docks.

A minimum depth of 35 feet of water prevails at the face of the dock at the lowest stage of the Columbia river. The largest steamships now entering the river draw 27 feet of water when loaded to capacity. The Columbia river is 2800 feet wide at this point, giving ample space for ocean-going vessels to turn around. Another advantage of the Longview harbor is the fact that it is at tidewater, making it particularly desirable as a stopping place for vessels after their cruise through salt water.

The export dock, now under construction, will have a storage capacity of 45,000,000 feet of lumber and sufficient berthing length to accommodate four 12,000 deadweight ton vessels at one time, the largest vessels now making this harbor a port of call.

Some idea of the immensity of this project is shown by the fact that the unit now being built will require approximately 6300 piling, 60 to 110 feet long, 4,000,000 feet of lumber, 30,000 cubic yards of rock rip-rap and 500,000 cubic yards of hydraulic sand fill.

The first unit is expected to be completed within from six to eight months at which time the west fir unit of the Long-Bell mills will probably be ready for operation. At present, four huge pile driving rigs and two rigs for sinking submerged bulkheads are busy on the site and a 30-inch suction dredge is engaged in the work of filling.



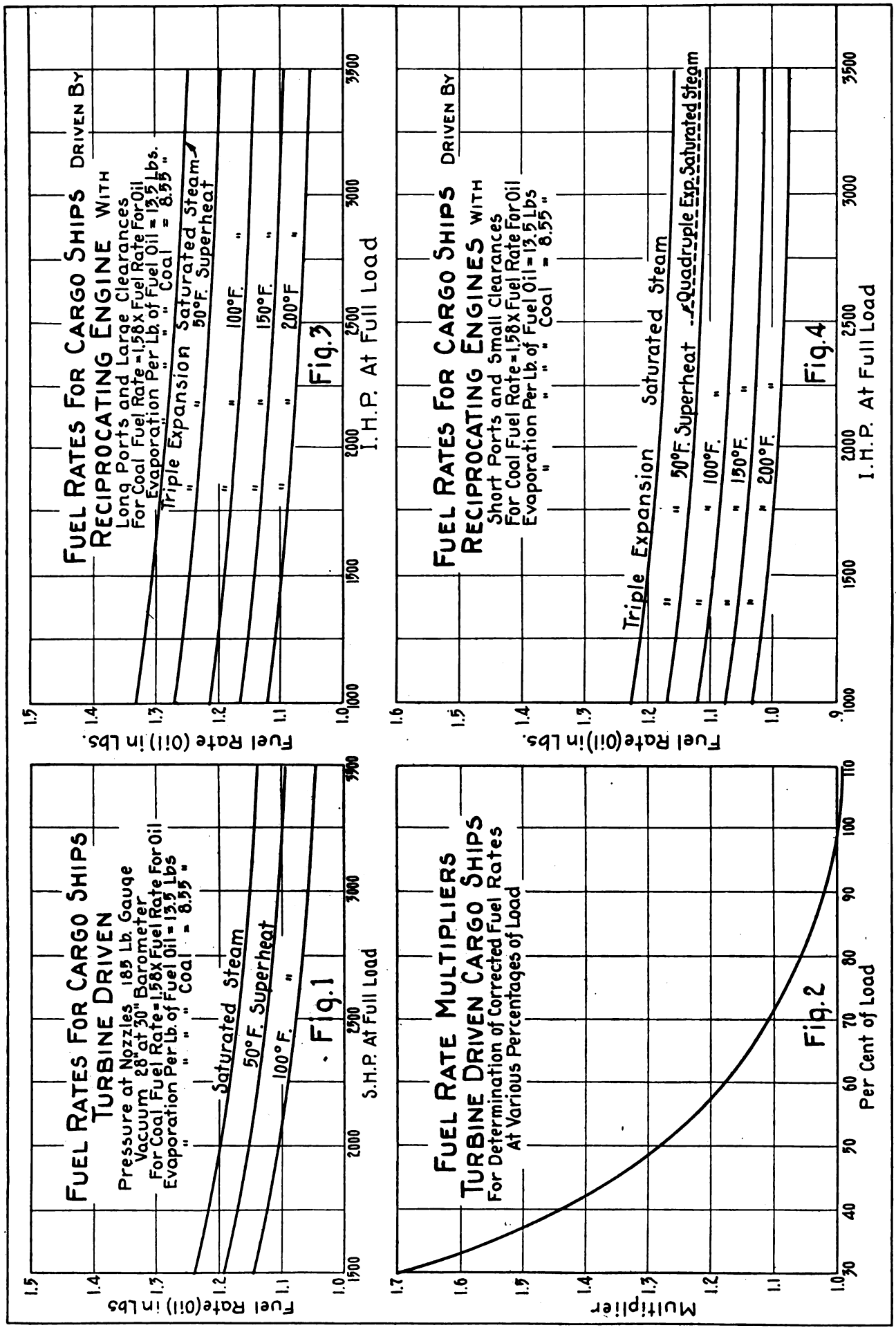
OCEAN-GOING FREIGHTER UNLOADING CONSTRUCTION MATERIAL AT NEW LONGVIEW DOCKS. A TANKER IS BOUND DOWNSTREAM WHILE ONE OF TWO FERRIES RUNNING BETWEEN LONGVIEW AND RAINIER, OREG., IS TAKING ON PASSENGERS AND CARS

Finds Wood Hulls Good for Barge Service

Four additional wood hulls, of the Ferris type, built for the government during the war, have recently been purchased by the Washington Tug & Barge Co. They will be converted into barges for freighting lumber between Puget sound and southern California. Equipment will include heavy masts, long booms, modern winches, ample steam power and large hatches for the economical and rapid handling of lumber. The same company is now successfully operating three similar barges on this service, it having been found that this type of craft is admirably adapted for the lumber trade, competing successfully with the ordinary steam schooner.

A. F. Haines, Seattle, vice president of the Admiral Oriental line, has been elected general chairman of the westbound Pacific conference. An increase of $1 per ton was adopted on about 50 items, applying to practically all freight except what is required in devastated Japan. The steamship operators expressed the opinion that while the freight situation is strong and justified increases, it was not the desire to profit at the expense of those who had suffered in Japan. On lumber, the rate was raised 50 cents per thousand feet to Japan and $1 to Chinese ports.

Announcement is made that the Anchor Donaldson line will soon inaugurate a freight service between Vancouver, B. C., and Montreal, via Panama. During the winter months, when Montreal is closed, St. John, N. B., will be used as the Atlantic terminus.



DATA CHARTED IN ESTABLISHING ENGINEERING PERFORMANCE STANDARDS

Fix Fuel Standard to Save Cost

Conservation of Fuel Obtained on Shipping Board Vessels by Setting Reasonable Basis for Engineering Performance

BY JOSEPH E. SHEEDY

IN THE early stages of the work of the fuel conservation section of the United States shipping board, it became evident that in order to attack the problem in an intelligent manner it would first of all be necessary to determine what a good reasonable performance should be for each of the vessels of the fleet.

This presented a very interesting problem, as it was necessary in setting this standard to adopt units of measure which would not only be fair and just but also could be readily and accurately determined without the aid of a large technical staff.

Units of Measurement

To meet the first part of this requirement a standard based on fuel per shaft horsepower seemed the most logical. But this was impossible if the second requirement was to be met. For the determination of an average shaft horsepower value for a vessel for a single passage is well nigh impossible without the aid of expensive instruments and a large corps of engineers to collect and compute the data. Therefore, this measure was abandoned.

The final units of measure adopted were the observed miles per ton of fuel, which will vary with draft and speed conditions attending each passage. The observed miles instead of wheel miles were chosen, as the object of these standards was not only to determine the efficiency of the engine department but to determine the efficiency of the entire vessel, which efficiency will not only be affected by the performance of boiler, main engine and auxiliaries, but also by the loading of the ship and the work of the navigator and helmsman.

The early standards which were drawn up were based on a flat rate of fuel per shaft horsepower and were made out for a limited range of speed. However, it soon became apparent that this scheme was not satisfactory, and the methods described later in this paper were adopted so as to compensate for the variance in water rate of the main engine at different loads, for the effect of the steam consumed by the auxiliaries on the water rate of the entire plant at various percentages of full load, and for the difference in boiler efficiency at the different rates of power at which the boilers must function for the changes in load.

Paper presented at the thirty-first general meeting of the Society of Naval Architects and Marine Engineers, New York, Nov. 7-8, 1923. The author, Joseph E. Sheedy, is vice president, Emergency Fleet corporation.

Method Used to Obtain the Distance for One Ton of Fuel

In order to obtain a standard for the distance steamed per ton of fuel, it is necessary to first obtain the power required to drive the ship at different drafts and speeds. This is done by obtaining the effective horsepower necessary under ideal conditions and adding a percentage in order to allow for average sea conditions. This increase in resistance is due to two items: First, the condition of the ship's bottom, and second, the effect of wind and sea. The first can be approximated with some degree of accuracy, but the second can only be very roughly estimated. After some investigation it was decided that the percentage increase in resistance decreased as the draft increased, and the following was adopted as a standard:

Draft beam	Percentage increase	Draft beam	Percentage increase
0.25	31.7	0.45	25.0
0.30	30.0	0.50	23.3
0.35	28.3	0.55	21.6
0.40	26.7	0.60	20.0

Having obtained the approximate effective horsepower necessary under average sea conditions, the shaft or indicated horsepower is calculated. For this the Dyson method of propeller analysis is used.

The next step is to obtain the fuel rate of the machinery under various conditions, after which the total fuel per hour and the nautical miles per ton of fuel are determined.

Estimating Fuel Rates of Cargo Ships

Before a standard of fuel rate can be established, certain items have to be determined as a basis of good operation. These are feed-water temperature, the heat values of the fuel, and the efficiencies of the boiler when oil or coal is used. The standards of each are given below for the average cargo carrier:

Feed water temperature, deg. Fahr. 210
B.t.u., per pound of oil 18,500
B.t.u., per pound of coal 13,500
Efficiency of boiler burning oil.... 0.75
Efficiency of boiler burning coal .. 0.66

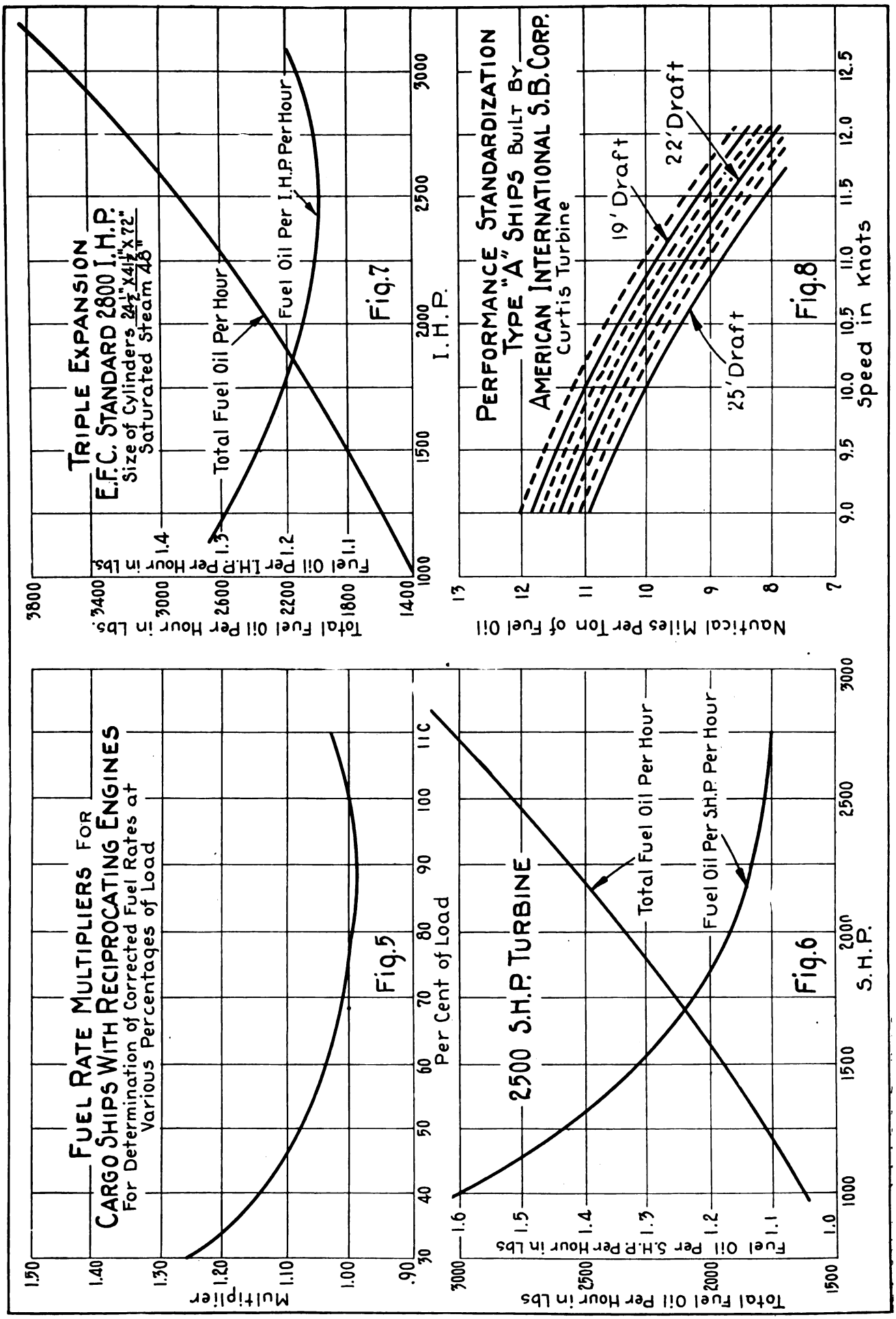
The boiler pressure is taken at 200 pounds gage, as this pressure is used on most of the cargo ships owned by the Emergency Fleet corporation. With this boiler pressure, feed-water temperature, heat values of fuel and boiler efficiency as given, the actual evaporation will be 13.5 pounds of water per pound of fuel oil and 8.55 pounds per pound of coal. The boiler efficiencies and evaporations may seem low when compared with tests or stationary plant practice, but due to the fact that the turnover in the fireroom crew is greater than that experienced in stationary plants and to the impossibility of obtaining as good results in operation as are obtained on tests. The above figures appear to be fair values to use.

Finding the Average

The water rates for the main engines or turbines and the auxiliaries of various sizes were determined from test data, and using the above figures for evaporation the curves on Figs. 1, 3 and 4, were drawn. These curves are based on the following assumptions: First, the auxiliaries use saturated steam. Second, all of the auxiliaries are of the approved marine type. Third, the machinery is kept in reasonably good repair and is operated with a reasonable degree of intelligence. Fourth, the steam pressure of the turbine inlet or the high pressure steam chest of a triple expansion engine is 185 pounds gage* and the vacuum is 28 inches for turbines and 25 inches for reciprocating engines. Should the ship be fitted with auxiliaries of different type, or the burners are of an antiquated or inferior design, allowances should be made.

When the ship is being operated at fractional loads the water rates vary from that at full load, and the evaporation of water per pound of fuel will also vary. The latter, however, is neglected, as the average variation is too small to be taken into account. The corrections for fractional loads for turbine-driven ships are shown in Fig. 2, while those for vessels of the reciprocating-engine type are given in Fig. 5.

*The curve for quadruple engines as shown in Fig. 4 is based on 200 to 205 pounds gage at the horsepower chest. If the steam pressure varied materially from the figures given, corrections should be made.



DATA CHARTED IN ESTABLISHING ENGINEERING PERFORMANCE STANDARDS

In order to illustrate the method used to obtain the fuel rate and the amount of fuel used for one hour the following examples are given:

Example 1.—Given a 2500 shaft horsepower turbine using steam at 185 pounds gage at the turbine inlet, 60 degrees Fahr. superheat at the throttle, and 28 inches of vacuum. Find the fuel rate and the fuel used per hour at various loads, oil being used as fuel.

From Fig. 1 we find that the fuel rate at 100 per cent load will be 1.11. For other than 100 per cent load this value should be multiplied by the correction factor shown on Fig. 2. The calculations are shown in Table II, from which the curves on Fig. 6, were drawn.

Example 2.—Given a 2800 indicated horsepower triple-expansion engine with short ports and small clearances, using saturated steam at 185 pounds gage at the horsepower chest. Find the water rates and fuel used per hour at various loads, oil being used as fuel.

From Fig. 4 we find that the fuel rate at 100 per cent load will be 1.163, and the correction factors for other loads will be found on Fig. 5. The calculations are shown in Table III, from which the curves on Fig. 7 were drawn.

If coal was used in place of oil, the fuel used per hour would be that as found in column 5 multiplied by 1.58.

Having found the fuel used per hour for the different powers and knowing the power necessary for the various speeds and drafts, the miles steamed per ton of fuel are obtained as shown in the following example:

Example 3.—For this example one of the 7500 deadweight-ton ships built by the American International Corp., known as the Hog Island type "A" ships will be taken. These ships are fitted with a 2500 shaft horsepower turbine of the impulse type and water-tube boilers built for 200 pounds working pressure and 60 degrees Fahr. superheat, and are fitted to burn oil fuel. The amount of fuel used per hour for various powers is taken from Fig. 6. As the method used for estimating the mileage per ton of fuel is the same for the different drafts, the calculations for the 25-foot draft only are shown in Table I.

Table I

Speed in knots	12	11.5	11	10.5	10	9.5	9
S. H. P. as obtained from propeller analysis	3,530	3,045	2,615	2,225	1,897	1,600	1,353
Fuel per hour in pounds from Fig. 6	....	3,340	2,857	3,530	2,265	2,025	1,850
Nautical miles per ton of fuel = speed × 2,240 divided by fuel per hour in pounds	....	7.71	8.63	9.30	9.89	10.51	10.90

After the mileage per ton of fuel is calculated, curves as shown on Fig. 8, are drawn.

The following instructions, which have been sent to the various operators of shipping board ships, explains how to use these curves.

The curves on these charts show the number of nautical miles that a ship should travel on a ton of fuel for various speeds and drafts, and have been adopted as a standard for the ships as designated.

In arriving at this standard, due consideration was given for the increase in power required to drive the ship at sea over that required under trial-trip conditions, and the increased fuel consumption of the machinery at sea over that on tests. It is not expected that the ship will do as well on every voyage as the curves show, as rough weather would decrease the mileage, yet in smooth seas the showing should be better, and the average performance should be equal to the standard, provided the ship and equipment are in proper condition and properly operated.

Table II

1	2	3	4=1.11×(3)	5=(2)×(4)
Per cent load	S.H.P.	Multiplier Fig. 2	Fuel rate oil	Fuel per hour in pounds
110	2750	0.991	1.100	3025
105	2625	0.995	1.104	2898
100	2500	1.000	1.110	2775
95	2375	1.010	1.121	2662
90	2250	1.023	1.136	2552
80	2000	1.057	1.173	2347
70	1750	1.105	1.226	2147
60	1500	1.175	1.305	1958
50	1250	1.284	1.425	1781
40	1000	1.440	1.598	1598

Table III

1	2	3	4=1.163×(3)	5=(2)×(3)
Per cent load	I.H.P.	Multiplier Fig. 5	Fuel rate oil	Fuel per hour in pounds
110	3080	1.025	1.192	3670
105	2940	1.012	1.177	3460
100	2800	1.000	1.163	3256
95	2660	0.992	1.153	3067
90	2520	0.900	1.151	2900
85	2380	0.991	1.152	2740
80	2240	0.998	1.160	2598
70	1960	1.015	1.180	2313
60	1680	1.039	1.208	2030
50	1400	1.078	1.253	1755
40	1120	1.143	1.328	1487

Table IV

Draught	Obs. speed	Tons fuel per 24 hours	Nautical miles per ton—fuel Actual	Theoretical	Per cent efficiency	Length of passage in naut. miles		Weather
1	2	3	4	5	6=4÷5	7	8=7×6	9
20′ 7½″	10.48	26.90	9.35	10.19	91.8	3,200	293,800	Good
22′ 3½″	11.39	29.20	9.35	8.64	108.3	1,500	162,500	Good
22′ 4¼″	11.26	27.09	9.97	8.84	112.8	2,000	225,600	Good
22′ 8½″	10.03	29.90	8.05	10.32	78.0	3,300	275,500	Good
22′ 9½″	10.63	32.61	7.82	9.60	81.5	3,200	261,000	Rough seas and head wind
22′ 10½″	11.84	33.41	8.51	7.78	109.4	1,800	196,900	Good
23′ 0″	11.23	32.99	8.17	8.78	93.1	2,500	232,800	Fair
Total						17,500	1,630,100	

Average efficiency = $\frac{1630100}{17500}$ = 93.1 per cent

The procedure for obtaining the performance of a ship on a voyage is as follows:

Divide the distance (in nautical miles) traveled by the fuel (in tons) consumed. This will give the actual miles per ton of fuel. From the chart (Fig. 8) find the standard nautical miles per ton of fuel for the draft and speed on this voyage as follows:

On the horizontal base line pick out average speed of the voyage. Run up this line in vertical direction until it intersects the curve corresponding to average mean draft, from this point follow over on horizontal line, to read the miles per ton of fuel which represents standard performance.

Divide the actual performance by the standard and multiply by one hundred. This will give the percentage performance for the voyage.

Example 4.—To find the percentage performance of a ship on a voyage.

For this we will take one of the 7500 deadweight-ton ships built by the American Shipbuilding Corp., known as Hog Island type "A" ship:

Mean draft on leaving port, ft. in. 24 0
Mean draft on arriving, ft. in... 23 0
Mean draft on voyage, ft. in. 23 6
Distance traveled, nautical miles.. 3,000
Fuel consumed, tons 310
Speed, knots 10.2

Actual nautical miles per ton of fuel = $\frac{3000}{310}$ = 9.68

Standard nautical miles per ton of fuel for 10.2 knots and 23 feet 6 inch draft (from curves)=9.95.

Percentage performance of passage = $\frac{9.68 \times 100}{9.95}$ = 97 per cent.

In order to obtain the average performance, the efficiency of each passage is multiplied by the distance steamed and these products are added, then divided by the total distance steamed, an example of which is given in Table IV.

As the work progressed it was found that the efficiencies were lower at the lighter drafts, due to the propeller being too near the water surface. In order to correct for this, the theoretical mileage per ton of fuel is taken at

CROSS SECTION OF UPPER AND MAIN DECKS OF NEW PUGET SOUND AUTO FERRY STEAMER DIESEL DRIVEN, THE FERRY MAKES FOUR RUNS OF 45 MILES EACH, EVERY DAY IN THE WEEK

a draft equal to the diameter of the propeller plus 10 per cent when the actual mean draft was less than this figure.

Port Consumption

The standards which have been outlined above are, of course, applicable to sea conditions only, and in order that erroneous conclusions shall not be drawn as to the performance of a vessel on any voyage due to the fact that the distribution of fuel consumption for the voyage is made so as to produce a good record for sea performance at the expense of the port performance, a set of standards for port consumption are now being compiled by the fuel conservation section of the United States shipping board. The basis of these standards is expressed in the following formula:

Port consumption = Number hours in port $\times K_1$ + tons of cargo $\times K_2$ + Bunker fuel $\times K_3$.

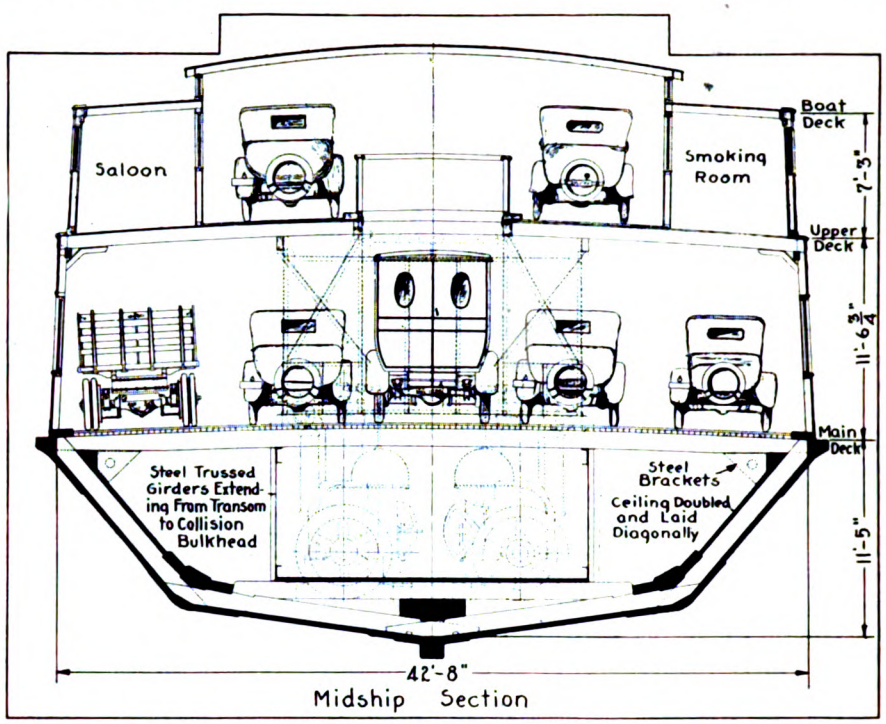
Where K_1=Constant which shall vary (1) according to type of auxiliary and deck equipment, (2) season of the year and outside temperature of the port.

K_2=A constant which shall vary according to type of cargo and how handled.

K_3=A constant which shall vary according to kind of fuel and methods used in handling as, for instance, in the case of fuel oil, it will depend upon whether or not the fuel is supplied from dock or from barges, and if from barges whether steam has been supplied to barge from the vessel for heating and pumping or for pumping only.

The determination of the proper values for these constants for the various vessels of the fleet is a considerable task, but it can be accomplished quite accurately, as has been seen from the records obtained from such classes of vessels as it has been applied to.

It is appreciated that these standards are not absolutely correct. They do, however, afford a method for making fair comparison of the performance of sister ships so that the poor performers may be readily segregated from the good performers in order that corrective measures may be applied, and also they do assist in determining whether the performance of the vessel is improving or otherwise.



New Auto Ferry Service on Puget Sound

In order to furnish convenient service for motorists visiting the most northwesterly section of the United States, the Canadian Pacific railroad has had a new auto ferry steamer, the Motor Princess, designed and placed in operation. Thus a circuit tour has been established, taking in Victoria, Nanaimo and Vancouver City, which is to be known by the name of the Bellingham-Vancouver island auto ferry circuit.

NEW AUTO FERRY

The ferry has been planned primarily for handling all types of motor cars, and has a capacity for about 50 cars. The steamer is completely fitted out, however, for carrying passengers, and every comfort in the way of ample deck space, observation room, lunch counter, etc., has been provided to enable passengers thoroughly to enjoy the 3-hour trip.

The vessel has a length of 170 feet over-all; 42 feet molded breadth; 11 feet molded depth. Two 600-horsepower McIntosh & Seymour diesel engines drive the steamer at a speed of 14 knots per hour. The distance between Bellingham and Sidney is about 45 miles, and two round trips per day, seven days per week, have been made during the summer period that the ferry has been in operation. The main deck has a height of about 11 feet in the clear and on it cars and trucks are carried five abreast. Space is provided on the upper deck for two rows of cars.

ENGINE ROOM OF FERRY

W. H. Snell, Vancouver, B. C., is the general passenger agent for the Canadian Pacific Railway Co., in charge of this service.

Editorial

All America's Plans for Her Ships Meet Foreign Opposition

BRITISH attention has been aroused by the 22 resolutions adopted at the meeting of the American marine congress in New York in November and printed in MARINE REVIEW last month. British shipping interests, although competitors, seem to be heartily in accord with a good many of the resolutions, especially the first three.

It is pointed out, however, that if some of the recommendations of the congress were adopted by the American government, the British government would surely retaliate. A representative of a large firm of shipowners trading from England to the Far East and around the world, said that if the American coastwise law should be extended to include the Philippines the British empire would be likely to retaliate in connection with the trade between Canada and Great Britain which is now open to American ships, and perhaps between other parts of the Empire, and he intimated that this question has already been considered by the board of trade.

It is also said in British circles that if attempts were made to carry out recommendation No. 10 to amend existing treaties with a view to establishing preferential treaties in favor of American shipping, the British government would take advantage of the occasion to amend its commercial treaties with the United States and to bring forward new propositions in its own interests.

With reference to the proposed 12-mile treaty, while no definite opinion is expressed, the feeling is that if this treaty should not go through, action might be taken with reference to American liners arriving in British ports without liquor.

It is believed in British shipping circles in London that recommendation No. 5 specifying that half of the emigrants to America must travel by American ships, is impracticable and also contrary to existing commercial treaties.

British shipowners and operators point out in general that the efforts of the United States to build up its merchant marine are thoroughly legitimate but it should not be forgotten that shipping is essentially an international business and that of necessity it must be conducted on more or less co-operative lines insofar as international relations are concerned, since it is very easy for foreign nations to retaliate against the shipping regulations of any country to which decided exception is taken.

* * *

The foregoing sums up briefly the general view held by British shipping men toward the latest phase of America's efforts to solidify the marine strength inherited from the war. From an American viewpoint, most of the opinions can be rebutted. The man on the top of the heap is always more interested in the sanctity of the *status quo* than the under dog. In this instance, the British merchant fleet is and has been on top and unfortunately suggestions tending toward the development of rival strength are considered prejudicial.

It would be decidedly interesting if foreign expert marine opinion could be persuaded to study America's shipping position and present a mature plan for strengthening our fleet. Every effort or suggestion which is advanced in this country meets foreign criticism, generally coated with the suggestion that our ambitions are natural and praiseworthy but that the particular plan then in the foreground steps on a lot of people's toes and besides would not accomplish the purpose of salvaging our fleet.

These foreign head shakings are always impressive. When we read that restricting 50 per cent of the immigrant trade to American vessels is impracticable, the first thought is that we are fracturing some sacred law and acting unfairly. But Italy held on to 100 per cent of her emigrant trade for quite a while and still keeps close to 90 per cent confined to her ships. And this is on the emigrant trade which of course includes some undesirables whom she probably would pay to get rid of while our desire for 50 per cent restriction would be on the immigrants who are coming to live in this country.

Europeans should learn that the American judgment on immigration has changed. Instead of an eager desire to have huge numbers land annually on our shores, a strong opposition has forced the restriction of the new arrivals with many citizens anxious to stop all immigration for years until the present groups are properly trained and assimilated. So this 50 per cent restriction to American vessels is dictated not, as in prewar years would have been the case, by a desire to appropriate a large share of a profitable trade but reflects the determination of the American people to keep the immigrant trade limited in numbers and more carefully chosen in quality.

Of course, many phases of our immigration service are not ideally handled now and the suggested law confining 50 per cent to American ships would not solve the problem, but the tendency is drifting toward more effective control. Naturally any country prefers to trust one of its national problems to its own citizens and ships rather than to outsiders.

Anglo-Saxons on both sides of the Atlantic feel that their unity will bring peace and progress to the world. Helping each other to strengthen weak spots in the industrial machine will do more to win that unity than idle talk of retaliation.

Late Decisions in Maritime Law

Legal Tips for Shipowners and Officers

Specially Compiled for Marine Review
By Harry Bowne Skillman
Attorney at Law

WHERE, when a ship reached a port in regular course before going to the port of her destination, her master learned that the congestion in the harbor of the latter place was so great, and the available discharging and warehousing facilities were so limited, that it would not be possible, under existing port regulations, for perhaps three months, either to deliver the cargo of rice or to get out of the harbor, and the master discharged the cargo at the former place, and it appeared that the shipper could have sold the cargo at the place in which it was discharged for as much as or more than it would have brought at such port of destination, the shipper was not entitled to damages, regardless of whether the bill of lading gave the master discretion to discharge the cargo at another point than that of agreed destination. Where a number of the bags of rice were never delivered anywhere, but were lost by the ship, and before delivery of any part of the cargo, the ship itself or some one on its behalf, notified the shipper of such loss, the shipper could recover therefor, notwithstanding failure to make claim for loss within the time limited by the bill of lading.—WEST CAWTHON, 281 *Federal Reporter* 895.

* * *

The contract of affreightment obliges the carrier, in the absence of a legal excuse, to carry the freight to the destined port in the vessel stipulated in the bill of lading. The vessel is liable for cargo removed therefrom and, without necessity, left at a place short of its destination. If the vessel needed repairs and a restowing of part of its cargo before proceeding on its voyage, those things should have been done, if they were reasonably practicable.—ELVASTON, 279 *Federal Reporter* 935.

* * *

An administratrix appointed in 1921 for the estate of a seaman who died in 1919 was entitled to maintain an action at law for his death under section 20 of the seaman's act, as amended by section 33 of the act of June 5, 1920.—Kierejewski v. Great Lakes Dredge & Dock Co., 280 *Federal Reporter* 125.

* * *

It is recognized law that a vessel owner may contract to carry contraband goods, and in such event he is not excused from complying with his contract because the goods are contraband. He may also contract to carry goods to a blockaded port, and such blockade would not excuse him, provided such contract is not illegal for some reason. The activities of the German submarines off the coast of the British Isles for the avowed purpose of sinking all vessels entering the forbidden zone was an effective blockade of the British ports, which excused a vessel owner from performing his charter agreement, under the clause exempting restraint of rulers. The published warning by the German government that it intended to sink all vessels entering the forbidden zone was an extraordinary occurrence, beyond the control of either party to a charter, entered into before the warning was published, for the carrying of a cargo to England.—M. A. Quina Export Co. v. Seebold 280 *Federal Reporter* 147.

* * *

The case of LUDLOW, 280 *Federal Reporter* 162, involved the responsibility of a master of a ship for the tort of an agent, growing out of a libel *in personam* against the master and owners of a ship, for an alleged abuse of the master's authority at sea. The court said: "There is a clear distinction in the admiralty law between the liability of the owner or principal as a consequence of the tort of the agent, when the act of the agent was in the exercise of delegated authority, or when the voluntary act committed by the agent was prompted by malice or other caprice. The test of the responsibility of the owner, as recognized in the admiralty law, is whether the tort was committed in the scope of the owner's business or authority, as distinguished from the voluntary act of the servant incident to temperament or impulse, as when the deed may be said to have been done maliciously. When malice actuates the injury, liability of the tortfeasor himself may be twofold: First, for the actual damage sustained; secondly, that which may be awarded as exemplary or punitive.

* * *

A steamer colliding with a schooner must justify herself for failing seasonably to discover the schooner and to keep out of her way. It was the duty of the steamship to discover a fog bank ahead of it, and to moderate her speed before entering it.—MUNALBRO, 280 *Federal Reporter* 224.

* * *

There was no duty resting upon the master of either of two boats to sound his whistle when approaching the other vessel, each showing the same colored light.—VOLUNTEER, 280 *Federal Reporter* 252.

* * *

Where an unarmed vessel was required by naval authorities to travel under the convoy of an armed vessel, she was under no legal obligation to render aid to the convoying vessel when the latter stranded, so that such services as she did render were voluntary, entitling her to salvage. The convoyed vessel owed a moral duty to assist to float the other after she stranded, though not a legal duty, and the existence of the moral obligation and the fact that the services resulted in the benefit to the salvaging vessel, as well as the other, will be considered in determining the amount of the salvage. Such an amount is not affected one way or the other by payments to the master of the assisting vessel, even if the owner of the assisted vessel attempted by a collusive settlement with that master to evade liability for a larger sum.—ST. CHARLES, 280 *Federal Reporter* 334.

* * *

A master of a vessel in a foreign port, in easy and frequent communication by cable with the owners, has no implied authority to bind them by a charter of the vessel.—Richichi v. James B. Drake & Sons, 280 *Federal Reporter* 421.

* * *

A vessel is not expected to hold her course and speed in a continuous straight line, when following a channel course that of necessity curves around bends.—INTERSTATE, 280 *Federal Reporter* 446.

* * *

A clean bill of lading, it was said in ST. JOHNS N. F., 280 *Federal Reporter* 553, has long been held to designate a stowage under deck, and the issuance of it is an indication by the shipowner of its election to stow under deck. Such a bill can not be said to be at variance with a contract of affreightment which provided for storage at the election of the shipowner, and having exercised its option by issuing a clean bill of lading, the ship is bound by the terms of the bill of lading, whatever may be the remedies of the shipowner as against other parties. When goods are carried on deck contrary to the obligations to carry under deck, they are carried at the risk of the shipowner in case of loss through jettisoning. The bill of lading must be deemed the only contract between the owner and the ship.

* * *

No lien exists against a vessel on behalf of an insurer on account of unpaid insurance premiums. Claims of an insurer of vessels for premiums on policies obtained by a receiver of the company owning the vessels against proceeds of sale of a vessel were not entitled to priority on equitable principles over the claims of lien creditors who contracted with the vessel sold prior to the commencement of the receivership; the receivership not being for their benefit.—WABASH, 279 *Federal Reporter* 921.

* * *

A shipper, it was held in the case of G. A. TOMLINSON, 279 *Federal Reporter*, 786, has a maritime lien enforceable by action *in rem* against the ship for failure to make "right delivery," including failure to deliver at an elevator designated in the bill of lading, though the cargo was delivered in good order at another elevator.

Late Decisions in Maritime Law

Legal Tips for Shipowners and Officers

Specially Compiled for Marine Review
By Harry Bowne Skillman
Attorney at Law

IT WAS brought out in the case of NURTURETON, 281 *Federal Reporter* 395, which was a suit for salvage, in aiding in the extinguishment of a fire which broke out in the hold of the vessel named, that the salvaging tug got its hose on the steamer's deck, and pumped water through the hose, but it was not clear whether the water went into the hold. The tug refused to move away at the request of the commander of a city fire boat, which was, of course, many times better equipped for efficient fighting of fire than was the tug, the captain of the tug telling the commander of the fire boat that he had gotten there first, and was going to stay there. The court denied salvage, and observed: "It is at least doubtful whether a private salvor can ever take such a stand without forfeiting all claim to reward. If he can escape such condemnation at all, it would only be when the value of his services is less questionable than in the instant case."

* * *

An employing stevedore must make such inspection of the equipment furnished by the vessel as a reasonably prudent stevedoring company would have made under like circumstances, and, if such casual inspection indicated danger, it was required to go further and make a more careful inspection, in order to eliminate the danger.—Port of New York Stevedoring Corp. v. Castagna, 280 *Federal Reporter* 618.

* * *

A tug is not an insurer, negligence must be affirmatively shown, not presumed, and navigators are not to be charged with negligence unless their decision is one that nautical experience and good seamanship would condemn as unjustifiable at the time and under the circumstances.—EASTERN, 280 *Federal Reporter* 711.

* * *

Where a seaman has been injured so as to prevent his working on a voyage, wages will not be allowed for a longer term than the voyage agreed upon, nor at a rate different from that agreed upon. Maintenance and cure, however, have been allowed for a longer term than the voyage, and it is manifest that this right to maintenance and cure is one not fixed by the contract at all, but is one developed by the admiralty courts out of the relation existing between the ship and the seaman.—CLIFTWOOD, 280 *Federal Reporter* 726.

* * *

The view which the persons engaged in the operation of saving and being saved took of the matter under the facts and circumstances then known to them is the important one, in determining award for salvage services, and not the view which might later be taken. Other important elements of salvage are the perils to the salvaging vessel, the time consumed, and the efficiency and promptness of the service. The efficiency, through proper equipment, to a large extent, offsets the absence of danger which often attends salving enterprises where the salvor is not properly equipped. In addition to these elements, as some courts say, or included in them, as others put it, is the actual damage to the salving vessel and the loss and injury directly traceable to the salving operation.—ALABAMA, 280 *Federal Reporter* 738.

* * *

A mortgage on an American ship, which is made to conform to requirements of ship mortgage act 1920, section 30, subsection D (a), to give it the status of a preferred mortgage, does not lose that status according to the case of OCONEE, 280 *Federal Reporter* 927, by the failure of the mortgager to keep a certified copy of the mortgage on board the ship, or of the master to exhibit it to the claimant of a subsequent lien, as required by subsection E.

* * *

A vessel is seaworthy, with respect to the cargo it offers to carry, when it is sufficient in materials, construction, equipment, officers, men and outfit for the trade or service in which it is employed. To render a vessel seaworthy with respect to her crew, she must be reasonably safe, and equipped with reasonably necessary and customary requisites and appliances, but she is not required to have the best appliances. Seaworthiness is a relative term.—Adams v. Bortz, 279 *Federal Reporter* 521.

* * *

Irrespective of the limits or nature of a wharfinger's liability, any person is liable for injuries to a boat which went where she did at his invitation, by his orders, and for his service, where he knew of the danger which produced injury, and negligently failed to guard against the plainly probable consequences of obedience to his own orders.—Wright & Cobb Lighterage Co. v. Warren, Moore & Co., 279 *Federal Reporter* 749.

* * *

"The law of the sea subjects each part of the venture to sacrificial liability, if such sacrifice becomes necessary, to save the other parts of the venture, and because this obligation is imposed by law and accepted by a participation in the venture, it follows, as a matter of fact and a sequence of law, that jettison of one part of the venture for the salvation of the residue of the venture is a danger of the sea * *. The three requirements of law which make jettison a proper basis on which to claim general average contribution are * * first, a common imminent peril; second, a voluntary sacrifice; and third, a successful termination. * * The existence of a necessity for jettison sacrifice made the master the agent of every part of the venture, and if sacrifice of any part of it became necessary to save the residue, the law made the master the agent of the sacrificial part, and empowered him to make a voluntary sacrifice thereof for the jettisoning owner, and at the same time the law made the master the agent of the remaining parts of the venture, to obligate them to contribute in due proportion to reimburse his sacrificing principal. * * The law having thus made the captain the agent of all, it follows that the law must make him an impartial agent. * * The navigation being at fault in this case, * * the share of the ship owned by the captain is, of course, not relieved of responsibility by the Harter act."—MARY F. BARRETT, 279 *Federal Reporter* 329.

* * *

A tug owned by the United States, but employed in towing vessels in the Panama canal, should be classed as a merchant vessel in respect to rendition of salvage services; she was engaged in the aid of commerce, for hire, and was under no duty to go to the aid of a vessel in distress, any more than a vessel owned by private persons engaged in the same line of business. She was wholly unlike a fire department extinguishing a fire, the very business for which it was maintained and paid. It has never been held that the crews of public vessels are not to be compensated in any case by way of salvage. That a vessel has been employed for a service for a fixed compensation does not prevent her crew from being awarded salvage for meritorious services not contemplated by the engagement. The existence of the contract is but an element to be considered in fixing the amount to be awarded for the unexpected service. That the crew are employed by their own vessel for fixed wages is a fact which exists in every case where salvage is allowed, and is not a barrier to an award of salvage, where the service performed was extraordinary. That the United States is the owner of both the vessel salved and the salving tug does not prevent the claim of salvage.—OLOCKSON, 281 *Federal Reporter* 690.

* * *

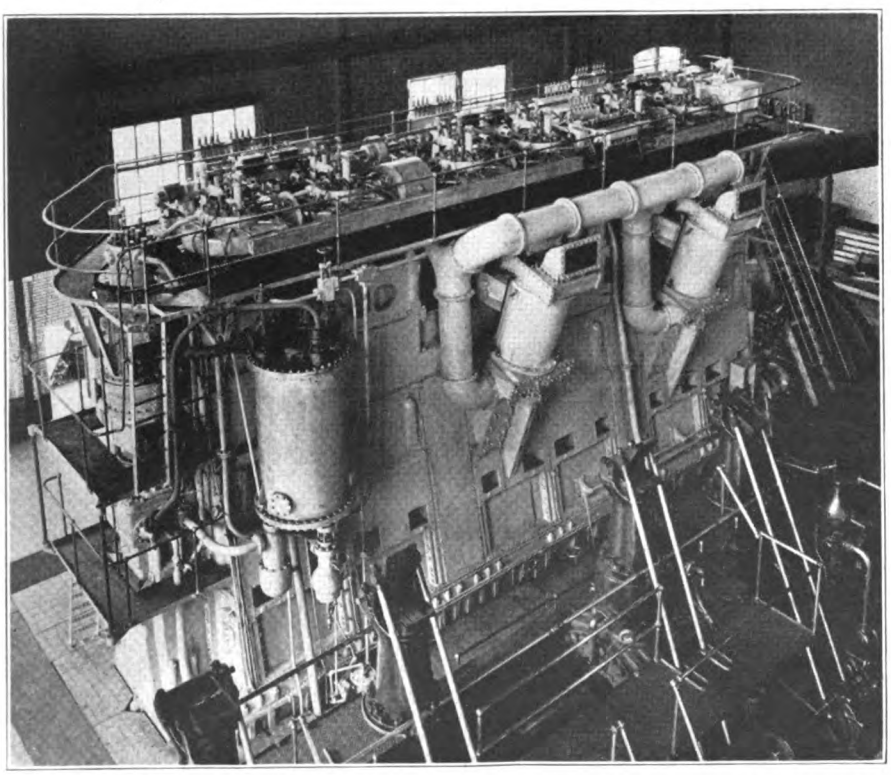
A restrictive provision in a contract for towage that the rates named are made upon the express condition that no claim for delay of any vessel served (whether due to repairs of damage or other causes) for which the towing company may be legally liable, shall in any case exceed $100 per calendar day of such delay, is valid.—Hand & Johnson Tug Line v. Canada Steamship Lines, Ltd., 281 *Federal Reporter* 779.

Test U. S. Designed Oil Engine

Bethlehem Engineers Demonstrate Diesel Unit Which They Developed and Built—Description of New Engine

IN NUMBER of vessels of 500 gross tons and over in June, 1914, driven by oil engines, the United States had a rank of fourth among the maritime nations of the world. This condition is revealed by a careful analysis and comparison of the international distribution of oil engined ships. It is interesting to note that though fourth in number of such ships the United States at that time was seventh in total gross tonnage which, of course, means that the average size of oil engined ships in the United States was considerably less than that of these ships in other countries. The average size per ship in 1914 of the entire world's fleet of oil engined vessels was 3233 gross tons, while the average size of the American ships was only 1290 gross tons. On the other hand, the Danish and German motor ships of that time averaged respectively 4925 and 4573 gross tons each, while the British averaged 3016 gross tons. The significance of these figures lies in the fact that the size of the engine must be in proportion, within comparatively narrow limits, to the size of the ship. It is, of course, much easier when an art is new to build smaller units and, therefore, the condition noted reflected the lack of progress up to that time in the art of building oil engines in this country.

How much improvement has taken place in the intervening nine years? Referring again to the records, it will be found that the percentage proportion of the total number and of the total gross tonnage for the United States though not the same, which would indicate an average size equal to the average size of the world's fleet, is much closer than in 1914. The grand average size has dropped to 2900 gross tons while the United States average has increased to 2200 gross tons. At the present time, the British Empire with 4410 gross tons, and Denmark, Sweden, Germany and Norway respectively with 4140, 3580, 3150 and 2457 gross tons lead the United States in average size of their motor ships. In other words, notwithstanding the fact that at the present time the United States holds third rank in both number and total gross tonnage of oil engined ships, only the British Empire and Norway possessing larger fleets both numerically and in total tonnage—in numbers the disparity is 10 in the case of the British Empire and only 1 in the case of Norway—her rank in average size per ships is only sixth. The conclusion from the above, therefore, since the trade in which American ships are engaged demands just as large ships as those needed by foreign nations, must be that certain definite reasons exist why the adoption of the larger oil engines for ship drives in the United States is much less general than abroad. What are these reasons?



BETHLEHEM 4000 INDICATED HORSEPOWER OIL ENGINE SHOWING INCLINED SCAVENGING AIR PUMPS AND ATTACHED COMPRESSOR

Retarding Factors in America

1. In the first place, the oil engine had its origin in Europe which helped greatly to develop over there a much wider familiarity with and confidence in this type of motive power. Consequently the manufacturers received aid and encouragement in their constant endeavors to increase the practical sizes.

2. It is distinctly impracticable from all motives of national interest and also on account of definite import restrictions, allowing that complete confidence existed in their satisfactory operation, to acquire engines abroad. Even engines have their national kinks and everything else being equal, an American would prefer an American built engine.

3. The system of licensing American manufacturers to build engines here under the foreign patents has become quite general and should work out successfully, but these engines will have to stand on the merit of their basic design and the possibilities for reduction in cost to meet competition. Until comparatively recently, the shipowner did not have full confidence that any American concern could supply him with an entirely successful oil engine, because in the comparatively short time they have been engaged in this work they had no large successfully operating marine unit to show.

4. Owing to the depression in the ocean carrying trade, high operating expense, and the oversupply of ships resulting in extremely low market values for shipping properties, and as the margin of profits anticipated

for any additional capital outlay is practically nil, owners, when in every other way converted to the use of oil engines, find great difficulty to finance the introduction of this type of engine in conversion projects or in new work, on account of the high first cost.

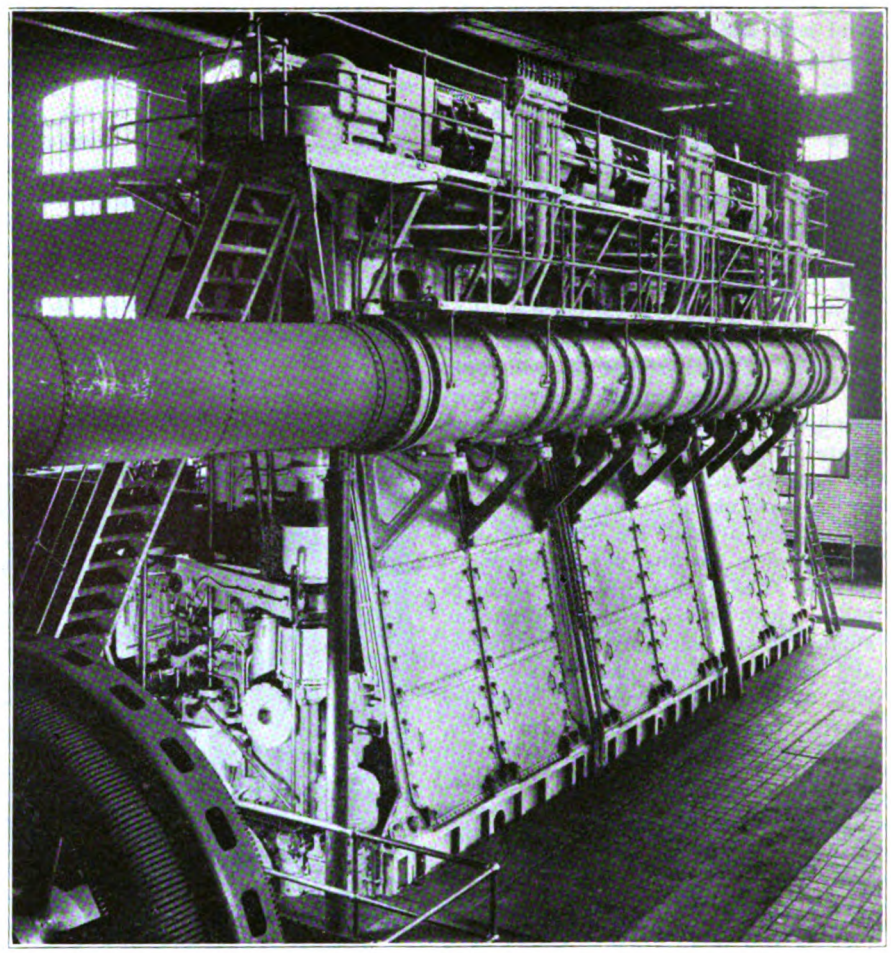
The recent conversion of several freighters and tankers of 5000 to 7955 gross tons in size to oil engine drives and the adoption of this type of engine in two 600-foot ore carriers now building on the Great Lakes has greatly increased confidence on the part of shipowners in the ability of American concerns to produce successful engines of large size.

Coming at this time, therefore, the highly successful public demonstration on Nov. 22, 1923, at Bethlehem, Pa., of a 4000 indicated horsepower oil engine of American design and manufacture throughout, should be of great benefit to the merchant marine in creating an atmosphere of complete confidence that the largest oil engines, comparable in every respect to the best foreign engines, can be designed as well as built here.

Decides to Build Engine

The expenditures involved in the independent development to a point of perfection of so large an oil engine are enormous and is a splendid exhibition of courage and enterprise on the part of the builders. The Bethlehem Steel Co. has for years designed and built gas engines of large power. It has also been a user of a great number of internal combustion engines mostly of 5500-horsepower each. Its experience, therefore, covers not only the design and construction but also the operation of large engines. With this experience as a foundation, the Bethlehem engineers visited Europe to inspect the different types developed there. It was decided after careful study that a superior engine could be produced using independent designs and methods of manufacture.

In the mechanical development of an engine subject to unremitting and severe service, any concern would be utterly foolish as a matter of self interest to fail to face facts in regard to its performance. That the Bethlehem Co. has boldly faced all the facts of performance with the determination to overcome all difficulties is evidenced by the fact that the engine illustrated herewith and which was publicly exhibited in Bethlehem was the second engine built. All of the lessons learned in the building and trial operation of the first engine, installed on the CUBORE of the Ore Steamship Corp., were incorporated in the second engine. Furthermore, it was only after a considerable period of entirely successful operation as one of the units in the power house at the mills and after a 30-day continuous endurance run and a thorough inspection of the engine on the completion of this run, showing the engine in excellent condition, that the representatives of the Bethlehem company were themselves satisfied that progress in the design and construction had reached a point where satisfactory operation could be safely guaranteed. The above is of the utmost importance, as the character of the concern and the history of the development, as well as trial performance help to safeguard the purchaser, who of necessity must accept a lot about oil engines on faith.



NEW ENGINE INSTALLED IN BETHLEHEM STEEL CO. POWER HOUSE. DIRECTLY CONNECTED TO AN ALTERNATING CURRENT GENERATOR, THE ENGINE SUPPLIES POWER TO THE STEEL MILLS

General data and characteristics of the engine are as follows:

Installed in Power House at Bethlehem, Pa.	
Indicated horsepower	4000
Brake horsepower	2900
Kilowatts per hour	1930
Revolutions per minute	116
Number of cylinders	6
Cylinder bore, inches	25.5
Stroke, inches	48
Mean indicated pressure	93.0
Weight per B. H. P.	280
Fuel consumption pounds per B. H. P. per hour	0.025
Length overall, ft, ins	42-9¼
Width of bedplate, ft., ins	9-10

Principal Characteristics

Vertical engine, 2-cycle, single acting, air injection, head scavenging, crosshead type, air starting, reversible, attached air compressor, attached scavenging pumps, water cooled throughout, forced lubrication.

During the demonstration of the engine the speed was gradually increased from slow, 35 revolutions per minute, to full, 116 revolutions per minute, clearly proving ease and flexibility of control. Maneuvering tests showed that the engine can be readily started and stopped and that it can be reversed from full speed ahead to full speed astern in 10 to 15 seconds. Operation at full load and constant speed was demonstrated by running the engine up to speed and connecting the

alternating current generator in parallel with the other power house generating units, at full load. Under all these conditions, the engine ran smoothly with a minimum of noise and with practically no vibration. For marine power installations directly connected, the engine would operate at 90 revolutions per minute.

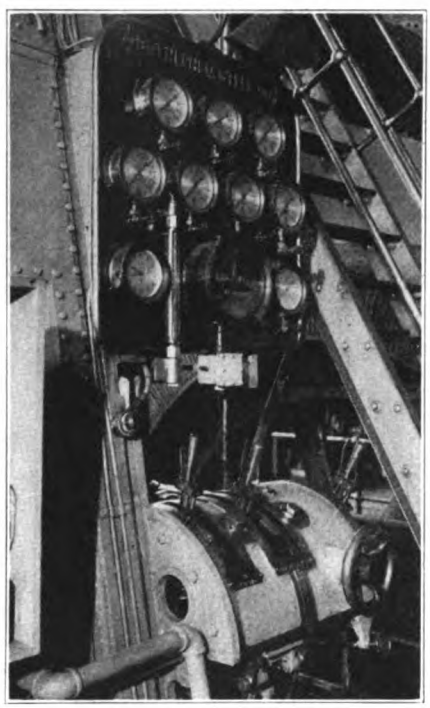
A full, detailed and clear description of this engine is given in a catalog on oil engines, recently published by the Bethlehem Steel Co. For the purposes of this article it will only be necessary to outline certain outstanding features. In principle, majority expert opinion probably favors the 2-stroke cycle over the 4-stroke cycle engine, particularly in large sizes. The advantages argued are that the fuel consumption for the power developed is less. The turning torque is more even which gives steady operation, eliminates the necessity of a flywheel and makes possible the reduction in size of the line, thrust and propeller shafts. In marine conversion jobs, this is of great importance as it will save the expense in most instances of increasing the size which means renewing the thrust, line and propeller shafting.

System of Scavenging

If all this is true, why the 4-stroke cycle engine at all? For one thing, great difficulty has been experienced in the efficient elimination of the particularly noxious spent gases. A number of builders of 2-stroke cycle oil engines claim to have overcome this difficulty. In the Bethlehem engine, scavenging, or clearing the cylinder of burnt gases, is accomplished with a fresh air charge, delivered at a low pressure (about five pounds) by the two large diameter, inclined, attached air pumps, entering through a single valve located in the top center of the cylinder. The scavenging air acts similarly to a solid piston forcing the burnt gases down and out through exhaust ports extending around the entire circumference of the lower part of the cylinder. This method not only gives efficient scavenging but also helps to maintain an even circumferential wall temperature and to reduce this temperature. Space is saved by placing the air pumps in an inclined plane to the side of the engine.

By arranging the scavenging air and fuel valves as a combined unit, the head construction for the cylinders is simplified so that the design gives maximum resistance to heat effects. Fuel injection at this top central point also gives maximum circumferential evenness of heat distribution. By the use of compressed air for fuel injection, better atomization is possible. There are no cylinder heads, only valve heads. The cylinders may be likened to bottles with the necks cut short, and the valve heads to stoppers. The pistons are removed from the bottom without disturbing any of the top cylinder gear.

Economy at all speeds is maintained by a system of fuel valve lift control by means of which the operator may quickly regulate all fuel valves from zero to full lift while maneuvering. In this manner the injection air



INSTRUMENT BOARD AND CONTROLS FOR STARTING, STOPPING AND REVERSING THE ENGINE. CHANGE MADE FROM FULL SPEED AHEAD TO FULL SPEED ASTERN IN FROM 10 TO 15 SECONDS

may be conserved and used in proper amount as needed instead of in excess as is the case with a constant lift fuel valve.

Ease and flexibility of maneuvering with the main engine, a primary consideration particularly in marine installations, is assured in this engine by the simplicity of the reversing gear, the fuel valve lift control, and the fact that fuel can be injected into the cylinders without shutting off the starting air. The latter is especially important because the engine continues turning over with air until combustion takes place in a sufficient number of cylinders. One cam shaft with one set of cams serves for both ahead and astern. The cam shaft is turned about its axis by an air operated reversing gear for the correct timing of the valves in either direction. Recognizing the danger of a multiplicity of controls and the possibility of serious damage if an operator should become confused, the method of control has been carefully considered. The controls are so arranged that it is a physical impossibility to cause any damage by their manipulation. A 3-stage air compressor driven from a special crank on one end of the crankshaft has been designed to assure reliability under continuous service for both land and marine installation.

This type of engine is designed in 4, 6 and 8 cylinders. Each pair of cylinders drives its own section of crankshaft and these sections are interchangeable. This method facilitates the assembly of the engine and the replacement of parts. The following ratings are given:

Single Screw Marine Service

No. Cylinders	R. P. M.	B. H. P.
4	90	1600
6	90	2400
8	90	3200

Results of 30-Day Test

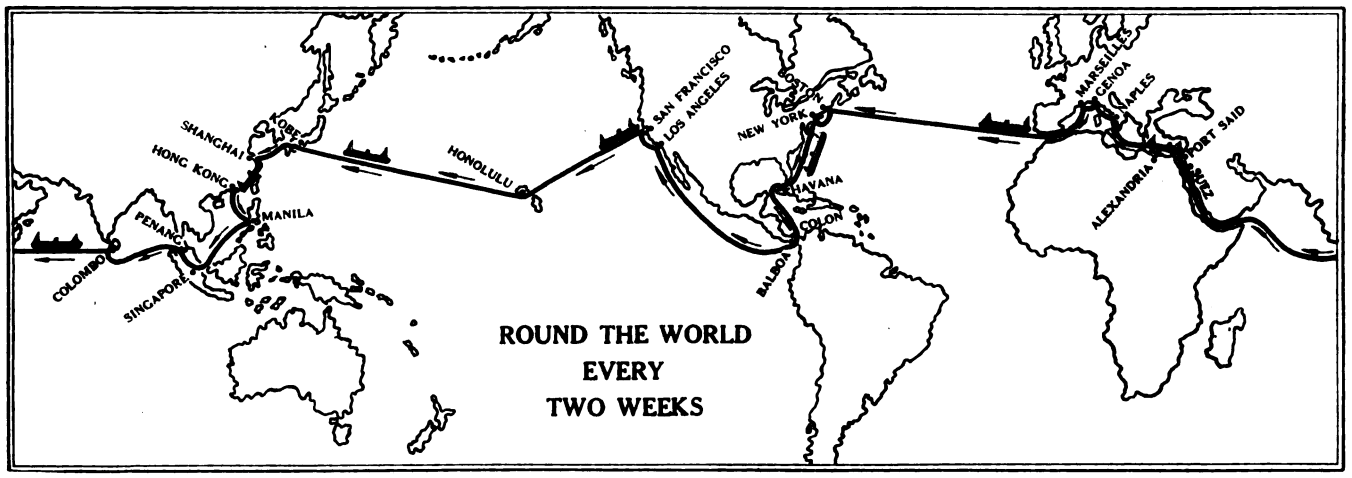
The following data gives the results of the 30-day continuous endurance run made at Bethlehem on the 6-cylinder oil engine discussed in this article and shown in the accompanying illustrations:

Duration, hrs., mins	730—35
Total revolutions	5,057,997
Average R. P. M	115.3
Total K. W. hours produced	1,211,900
Average K. W. load	1659
Average B. H. P	2522
Average I. H. P	3582
Average mech. efficiency, per cent	70.4
Total pounds fuel oil consumed	849,829
Average pounds fuel oil per K. W. hour	0.70
Average pounds fuel oil per B. H. P. hour	0.46
Total gallons bearing oil consumed	716.0
Total gallons cylinder oil consumed	189.5
Total pounds cup grease consumed	158.5
Average gallons bearing oil per hour	0.98
Average gallons cylinder oil per hour	0.25
Average total gallons lubricating oil per hour	1.23
Equivalent sea mileage of total revolutions	8700

Note: Ordinary plant fuel oil was used, varying from 22 to 30 degrees Baume, with high sulphur content.

It must be borne in mind that the

Capt. Robert Dollar Is Starting 7 Big Liners on This World Trade Route



ANNOUNCEMENT has been made for the Dollar Line that arrangements have been completed for the round the world service of the passenger and freight vessels purchased from the shipping board. The PRESIDENT HARRISON and the PRESIDENT HAYES are to sail from San Francisco, Jan. 5 and Feb. 2 respectively. Sailings from New York will be as follows: the PRESIDENT ADAMS on Feb. 7, PRESIDENT GARFIELD on Feb. 21, PRESIDENT POLK on March 6, PRESIDENT MONROE on March 20, PRESIDENT HARRISON on April 3, and PRESIDENT VAN BUREN on April 17. After this a regular schedule will be maintained every two weeks. The rates around the world will range from $1250 to $1890 for cabin passengers. Regular conference rates will be maintained in the intercoastal trade.

These seven ships are each 522 feet in length. They will call at 22 ports, giving five groups of services, intercoastal, transpacific, Orient-Europe, transatlantic and round the world. The voyage takes 112 days.

Capt. Robert Dollar is again making marine history with this service, as the idea of a regular, scheduled round the world passenger and fast freight service is new. His terms of purchase guarantee the maintenance of the route for five years and the captain has the habit of winning.

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consumption figures are those for a completely self-contained unit, and that if not attached to the engine, separately driven auxiliaries would be necessary for a number of functions accomplished by the main engine.

There can be no question but that the 80 representative marine men who witnessed the operation of this oil engine at Bethlehem were greatly impressed by its performance. General opinion seemed to be that the possibility of reducing the cost is of paramount importance. With the developing and experimental stages passed, the problem of cost within certain limits will be solved by proper methods and management. In the latter, in industry, America is pre-eminent, and it may, therefore, confidently be expected that ways and means will be found for reducing cost.

The port of Seattle has authorized the preparation of plans for a proposed transit shed, 120 x 500 feet, to be erected on the Smith Cove terminals. The cost is estimated at $100,000. Increased overseas business is said to justify enlarged facilities.

The American Hawaiian Steamship Co. has announced the appointment of Fred A. Hooper as assistant traffic manager with headquarters in San Francisco.

Gives Specifications On Condenser Tubes

The American Brass Co., Waterbury, Conn., has recently issued a new catalog on Anaconda condenser tubes, containing an authoritative discussion with specifications. This publication shows careful preparation. The first portion is devoted to an informative resume of the qualities required in condenser tubes for best service, including the composition and purity of the raw materials used, physical properties and soundness of the alloy and the strength and stiffness of the tubes. The second part, following the statement that the company recommends the purchase of condenser tubing under strict conformity to American Society for Testing Materials specifications or to some modification gives in detail a set of specifications differing from the American Society for Testing Materials specifications only in the manner of wording. It is pointed out that either the cupping or cast shell process of manufacture may be designated as desired.

All engineers who have anything whatever to do with the maintenance of marine or stationary installations in which condensers are used will find this publication a useful and valuable addition to the knowledge which wide experience and thorough scientific study is bringing to a correct solution of condenser tube difficulties.

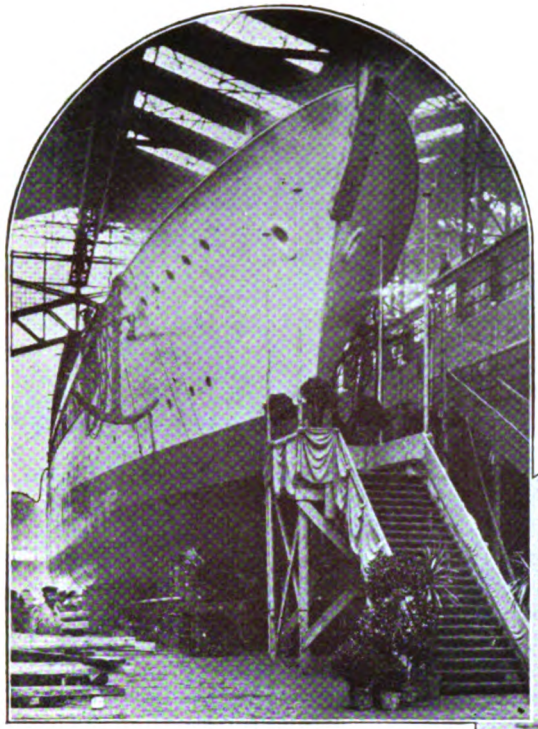
Keep Old Cable Ship

North Pacific shipping men were recently interested in the announced sale of the cable steamer BURNSIDE which last year was withdrawn from north Pacific cable service. However, the department has canceled its invitation for bids as it has been decided to use the BURNSIDE in connection with the DELLWOOD in cable work. The BURNSIDE was captured from the Spaniards in 1898 and has since been used by the United States government.

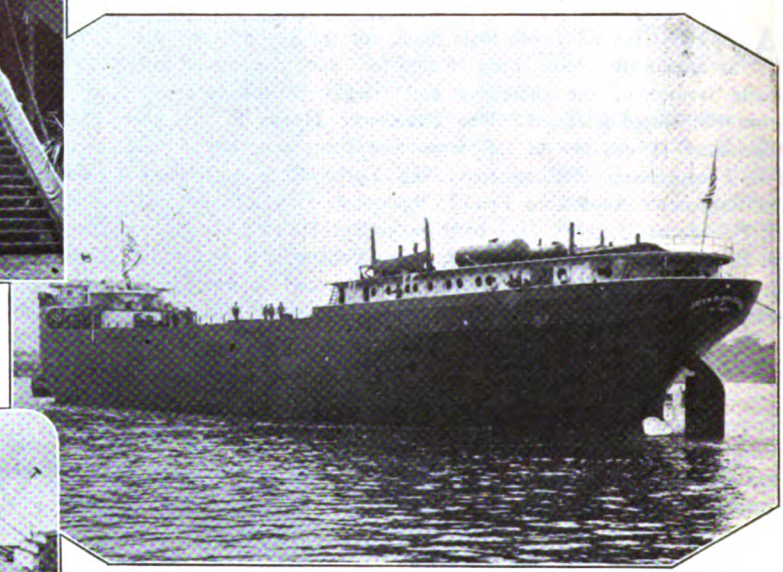
Appointment of L. W. Baker, formerly district agent for the Williams Steamship line, to the position of assistant general freight agent for the Alaska Steamship Co. has been announced. Mr. Baker will continue to have his headquarters at Seattle. His position is a new one created to relieve John H. Bunch, traffic manager, of some of his duties.

Announcement has been made that the Burton Steamship Co. will operate the steamer JEANETTE on the Boston-Philadelphia run with weekly sailings from each instead of every 10 days.

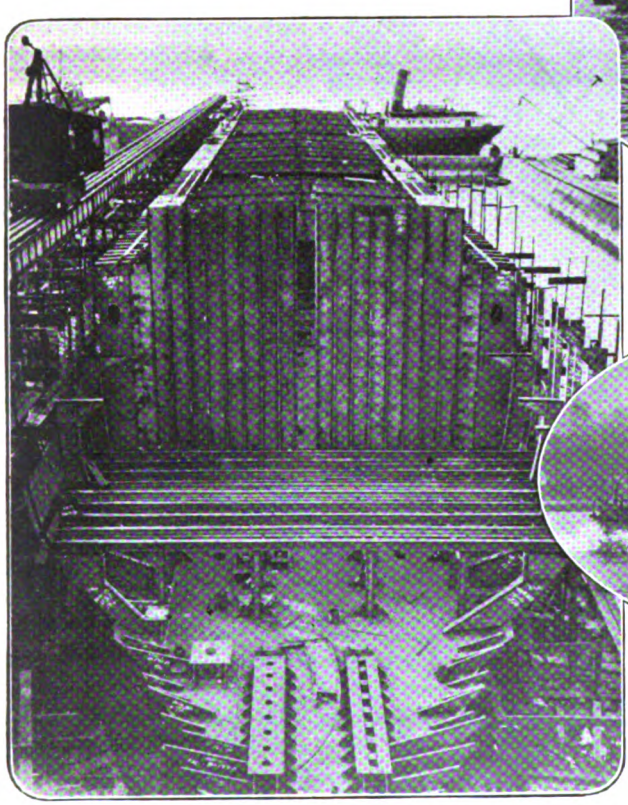
Photographs from Far and Near



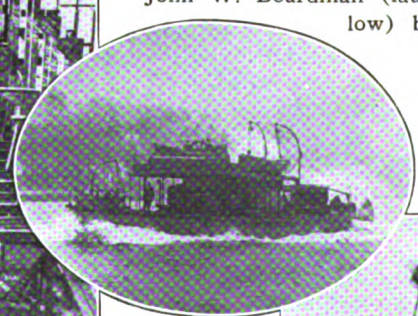
The Vanadis, one of the largest yachts of her type, designed by Cox & Stevens, for C. K. G. Billings, New York, was successfully launched at the yard of the builders, Fried. Krupp, in Kiel, Germany, on Nov. 15. She will be delivered during January. She is 240 feet in length overall, 35 feet beam and 14 feet draft. Twin screws are driven by two diesel engines which develop 1800 horsepower and which will give a speed of something over 14 knots. Fuel and storage capacity in all departments will suffice for a cruise of 12,000 miles. The accompanying photograph shows the Vanadis just about to be launched. She is a fine, able, seagoing vessel, capable of going anywhere on any ocean.



Shipyards on the Great Lakes have been building big freighters at a time when this class of vessels is a rarity in other shipbuilding plants throughout the world. Recently commissioned is the self-unloader John W. Boardman (launching shown above and below) built by Toledo Shipbuilding Co.



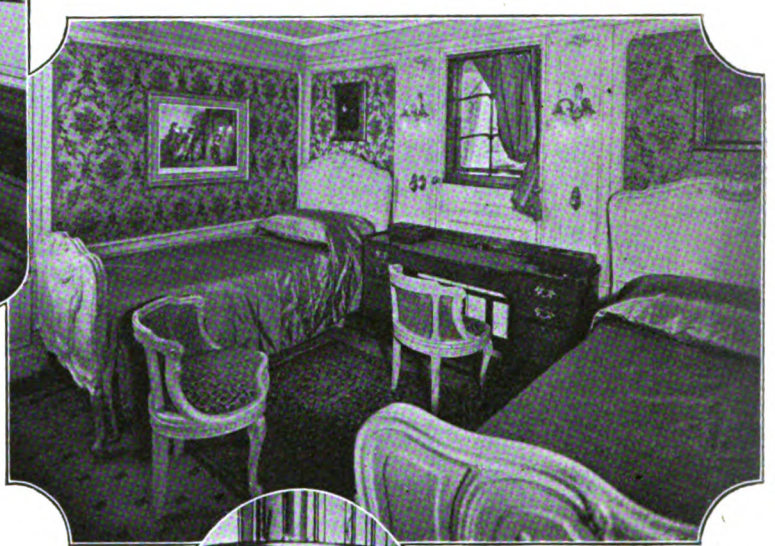
Another bulk freighter at the Toledo yard is shown above. She is the William K. Field, a 600-foot, 13,000-ton carrier, ordered by the Reiss Steamship Co. She is scheduled for launching in January.

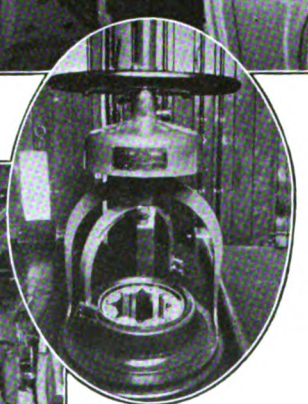


Shallow draft steamer driven by new type of partly immersed vane wheels.

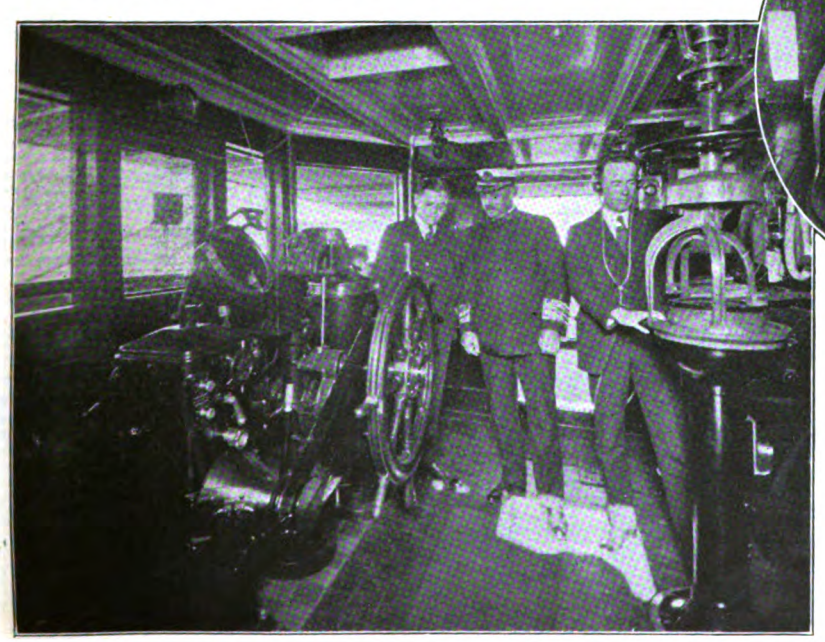
Latest Marine News in Pictures

Italian liner Duilio with her sister ship Guilio Cesare are Italy's largest and most luxurious ships. They run both in the Italy-New York and Europe-South America service during different seasons of the year. The Duilio, which is illustrated in these three upper views, is 658 feet long, 79-foot beam, 27,000 tons displacement, 22,000 tons gross. Her machinery comprises four turbines of 23,000 horsepower, each turbine driving its own propeller shaft. She has 64 oil burning furnaces and a speed of 20 knots. The ship is fitted with magnetic compass, gyroscopic compass and radio compass, has a powerful wireless telegraphy plant and a large fleet of lifeboats. Her passenger accommodations are; first class 280, second class 335, intermediate class 335, third class 180, steerage 420. In first class accommodations, practically every room has a private bath and toilet, hot and cold, fresh and salt water.





Gyro-compass radio repeater of Sperry type mounted with the Kolster type radio position finder on the American liner President McKinley.



Elmer A. Sperry Jr. (Left) son of the inventor of the Sperry gyro-pilot, demonstrates the set installed on the Matson Navigation Co.'s S. S. Maui. Capt Peter Johnson, commodore of the Matson fleet, is listening to Mr. Sperry. At the right stands V. Ford Greaves, representative of Dr. Frederick Kolster. Mr. Greaves is testing out the Kolster radio compass and direction finder.

Marine Business Statistics Condensed

Record of Traffic at Principal American Ports for Past Year

New York

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
November, 1923.	418	1,758,503	461	1,976,338
October	462	1,868,446	489	1,993,758
September	428	1,818,981	477	1,978,023
August	468	1,855,045	520	2,039,732
July	462	1,799,886	490	1,962,302
June	466	1,799,908	518	2,075,654
May	500	1,849,548	501	1,874,019
April	469	1,818,531	467	1,788,555
March	477	1,764,093	494	1,857,212
February	395	1,437,919	413	1,529,096
January	423	1,679,843	439	1,690,010
December, 1922.	397	1,569,778	473	1,819,341
November	426	1,626,068	463	1,805,798

Philadelphia

(Including Chester, Wilmington and the whole Philadelphia port district)
(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
November, 1923.	78	198,122	54	135,077
October	93	241,457	64	178,279
September	92	236,293	74	182,700
August	97	251,295	73	180,771
July	109	269,158	77	177,700
June	102	257,507	69	191,633
May	105	267,441	82	207,209
April	87	218,177	83	229,333
March	111	306,580	76	209,261
February	67	160,678	54	139,701
January	98	287,240	64	182,402
December, 1922.	78	209,962	63	167,736
November	75	221,130	78	241,326

Boston

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
November, 1923.	91	305,230	60	166,404
October	118	354,296	59	156,940
September	117	307,719	79	185,726
August	126	302,391	86	178,706
July	146	337,033	85	174,106
June	176	319,135	128	176,853
May	159	328,183	108	176,845
April	106	328,372	67	197,510
March	106	330,766	51	139,776
February	102	323,880	48	128,949
January	148	429,849	61	160,090
December, 1922.	138	383,366	61	181,975
November	130	357,264	59	123,255

Portland, Me.

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
November, 1923.	25	80,910	24	74,849
October	19	39,456	15	32,471
September	9	22,724	10	25,582
August	11	24,155	8	18,838
July	8	18,148	9	17,770
June	7	22,613	8	25,941
May	8	16,470	11	17,781
April	22	75,012	29	100,274
March	29	94,128	31	83,391
February	33	91,190	36	100,312
January	49	144,429	42	126,949
December, 1922.	48	144,019	48	136,247
November	22	45,567	21	46,755

Providence

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
October, 1923..	8	30,248	9	24,821
September	9	31,514	12	41,646
August	9	34,323	9	27,664
July	10	25,155	7	29,316
June	7	25,466	5	17,238
May	9	31,731	8	38,870
April	10	33,783	12	41,352
March	8	31,910	8	34,367
February	17	56,353	10	39,840
January	13	45,175	12	52,651
December, 1922.	6	23,609	8	29,871
November	11	47,565	10	31,470
October	9	31,293	9	31,232

Baltimore

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
October, 1923...	96	285,871	95	297,566
September	94	292,315	99	297,965
August	100	303,073	92	262,306
July	130	390,465	137	395,206
June	140	407,872	135	406,138
May	156	476,041	160	468,248
April	159	470,698	138	416,969
March	123	375,762	117	354,803
February	80	240,133	94	275,291
January	115	322,661	110	306,393
December, 1922.	110	322,948	104	380,616
November	114	361,162	132	403,593
October	97	289,239	101	304,431

Norfolk and Newport News

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
November, 1923.	24	65,263	83	239,807
October	18	56,473	65	188,805
September	14	37,823	65	184,646
August	36	113,070	81	244,366
July	41	108,465	108	296,197
June	36	107,218	66	190,218
May	62	188,850	93	286,420
April	21	65,350	73	212,453
March	16	51,333	71	200,858
February	8	24,958	42	130,121
January	14	41,127	44	121,152
December, 1922.	19	52,716	40	137,081
November	6	21,036	38	118,738

Savannah

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
November, 1923.	24	75,739	23	67,551
October	31	89,817	33	91,089
September	29	82,569	27	83,689
August	18	55,205	20	59,452
July	18	53,071	22	60,711
June	27	77,392	31	90,636
May	26	67,494	23	63,395
April	26	81,582	27	83,365
March	31	95,905	30	89,323
February	31	87,315	31	87,703
January	28	93,564	28	93,587
December, 1922.	22	66,619	17	57,279
November	14	41,665	15	40,606

Key West

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
November, 1923.	80	97,642	85	97,599
October	83	103,328	82	95,506
September	69	77,687	74	84,612
August	80	94,591	82	93,028
July	88	96,514	86	97,260
June	93	105,045	93	102,123
May	97	102,033	95	101,422
April	84	85,964	83	88,475
March	91	88,639	90	83,220
February	69	68,735	64	68,658
January	89	81,622	86	79,210
December, 1922.	74	77,623	78	85,839
November	69	71,740	70	71,705

Portland, Oreg.

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
November, 1923.	30	113,362	34	120,487
October	21	78,191	48	174,275
September	23	86,194	41	138,470
August	17	64,218	31	106,478
July	19	66,048	24	86,474
June	22	87,147	25	87,419
May	16	58,889	21	72,663
April	17	62,287	22	84,940
March	16	69,514	22	78,124
February	13	46,219	18	66,446
January	12	47,848	25	97,674
December, 1922.	13	46,245	31	104,065
November	18	63,016	32	106,367

New Orleans

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
November, 1923.	216	575,102	218	605,923
October	226	605,211	239	649,791
September	205	548,914	169	444,881
August	235	605,671	249	639,802
July	237	602,017	227	587,966
June	230	584,271	226	572,211
May	221	550,817	237	603,128
April	234	612,572	237	623,539
March	253	648,990	269	682,080
February	204	559,638	206	539,965
January	242	713,589	233	695,524
December, 1922.	211	543,884	222	573,111
November	220	598,306	219	599,150

Galveston

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
November, 1923.	61	172,824	95	301,148
October	83	209,343	108	334,544
September	64	164,854	100	290,715
August	69	172,330	92	257,371
July	70	178,601	77	198,200
June	77	178,013	82	209,893
May	78	181,759	97	256,745
April	65	162,317	77	209,388
March	58	170,841	97	287,278
February	48	146,944	76	233,591
January	69	219,967	89	282,889
December, 1922.	64	214,952	79	260,159
November	56	174,964	87	304,352

Port Arthur, Tex.

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
September, 1923.	31	88,978	42	121,898
August	45	122,018	56	156,908
July	36	107,997	49	122,785
June	52	161,207	57	174,651
May	59	187,057	64	206,089
April	58	191,158	56	188,376
March	64	188,176	55	169,005
February	52	172,273	44	142,554
December, 1922.	59	210,778	65	218,274
November	42	143,551	47	154,010
October	68	227,039	66	217,502
September	53	158,181	57	168,681

Mobile

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
November, 1923.	74	148,297	78	145,886
October	68	123,532	60	120,606
September	60	126,005	52	105,247
August	64	191,968	67	146,191
July	73	136,242	66	123,405
June	64	136,311	61	132,863
May	74	167,509	74	174,851
April	89	199,871	82	163,074
March	88	203,032	88	206,285
February	83	186,479	72	160,777
January	77	145,151	67	153,001
December, 1922.	66	123,746	56	119,821
November	68	147,775	55	130,769

Houston

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
October, 1923...	75	24,076	70	268,416
September	66	58,704	61	92,664
August	58	43,258	56	211,348
July	48	42,447	48	177,666
June	49	72,875	50	197,081
May	54	60,640	50	182,691
April	47	72,722	55	119,521
March	54	69,428	51	135,906
February	49	50,379	48	167,872
January	49	36,744	52	146,532
December, 1922.	58	70,948	53	195,322
November	65	72,192	63	215,043
October	55	57,106	53	168,254

Marine Business Statistics Condensed

Port Traffic Record

San Francisco

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
November, 1923.	69	281,081	70	243,152
October	56	205,175	71	249,035
September	43	165,798	63	209,930
August	64	208,625	65	224,918
July	68	244,530	58	189,348
June	59	204,204	65	227,566
May	64	230,778	69	244,321
April	61	199,831	63	227,467
March	50	168,399	71	237,195
February	47	165,333	60	214,686
January	51	156,249	65	216,083
December, 1922.	54	187,648	68	234,385
November	42	154,024	42	154,280

Los Angeles

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
October, 1923...	178	236,116	242	194,872
September	88	257,074	110	193,177
August	80	193,400	63	161,380
July	78	265,294	56	187,987
June	87	212,483	53	175,799
May	78	246,275	53	179,360
April	87	269,264	72	165,302
March	115	251,459	90	185,155
February	86	148,957	83	137,564
January	91	153,564	92	141,332
December, 1922.	133	132,114	76	83,537
November	110	111,803	111	112,934
October	117	115,548	138	94,522
September	61	127,969	96	133,561

Seattle

(Exclusive of Domestic)

Month	—Entrances— No. ships	Net tonnage	—Clearances— No. ships	Net tonnage
November, 1923.	48	199,115	46	191,022
October	39	184,717	47	200,668
September	32	142,052	40	159,006
August	39	173,885	37	163,188
July	30	148,607	32	149,239
June	36	147,186	39	184,732
May	29	133,752	37	159,393
April	32	141,569	31	133,950
March	28	129,070	30	138,428
February	26	120,548	39	156,258
January	27	125,551	36	155,129
(Inclusive of Domestic)				
December, 1922.	201	560,159	198	564,367
November	138	374,871	139	374,871

Origin of Name Schooner

Gloucester, Mass., recently celebrated its three hundredth anniversary. History has it that it was in Gloucester that the word "schooner" originated, the word being unknown prior to 1713. In this year, Capt. Andrew Robinson built a vessel at Gloucester which he masted and rigged in a peculiar manner. As the vessel was being launched off the stocks a spectator cried out, "How she scoons." At this the captain returned, "A schooner let her be." And thus the name came into marine vocabulary. Scoon was the word used in the dialect of that day to describe a skipping or skimming motion.

The Beacon Oil Co., Everett, Mass., has been awarded contract to supply "C" grade bunker fuel oil at the port of Boston.

Capt. Robert Milliken and all the other officers of the British steamer SIBERIAN PRINCE have been exonerated of blame for the vessel's stranding near Victoria, B. C., last July. The court sustained Captain Milliken's contention that a neutral zone prevailed at the scene of the accident where it was impossible to pick up the fog signals.

Record of Traffic Through Panama Canal

		Atlantic to Pacific traffic —Panama Canal— No. of ships	Net tonnage	Tons of cargo	Pacific to Atlantic traffic —Panama Canal— No. of ships	Net tonnage	Tons of cargo	Total traffic through canal —Panama Canal— No. of ships	Net tonnage	Tons of cargo
1923										
October	American	132	727,005	286,947	129	687,521	1,141,192	261	1,414,526	1,428,139
	Foreign	97	451,734	335,800	69	273,215	363,628	166	724,949	699,428
	Totals	229	1,178,739	622,747	198	960,736	1,504,820	427	2,139,475	2,127,567
September	American	111	598,331	251,797	126	686,359	1,132,572	237	1,284,690	1,384,369
	Foreign	87	382,506	259,922	89	377,356	524,412	176	759,862	784,334
	Totals	198	980,837	511,719	215	1,063,715	1,656,984	413	2,044,552	2,168,703
August	American	157	825,056	435,851	127	670,023	1,071,457	284	1,495,079	1,507,308
	Foreign	104	445,708	302,749	66	291,803	358,693	170	737,511	661,442
	Totals	261	1,270,764	738,600	193	961,826	1,430,150	454	2,232,590	2,168,750
July	American	146	743,072	361,335	139	751,940	1,194,357	285	1,495,012	1,555,692
	Foreign	109	464,386	328,697	80	350,629	453,395	189	815,015	782,092
	Totals	255	1,207,458	690,032	219	1,102,569	1,647,752	474	2,310,027	2,337,784
June	American	131	705,481	385,843	115	607,950	1,022,421	246	1,313,431	1,408,264
	Foreign	96	405,816	270,146	75	316,655	418,036	171	722,471	688,182
	Totals	227	1,111,297	655,989	190	924,605	1,440,457	427	2,035,902	2,096,446
May	American	133	715,061	406,699	120	651,504	1,096,175	253	1,366,565	1,502,874
	Foreign	96	424,600	335,652	70	337,249	426,557	166	761,849	762,209
	Totals	229	1,139,661	742,351	190	988,753	1,522,732	419	2,128,414	2,265,083
April	American	123	662,300	331,114	116	637,178	1,041,481	239	1,299,478	1,372,595
	Foreign	81	360,318	322,255	84	347,894	492,295	165	708,212	814,550
	Totals	204	1,022,618	653,369	200	985,072	1,533,776	404	2,007,690	2,187,145
March	American	119	635,992	348,598	96	509,443	819,204	215	1,145,435	1,167,802
	Foreign	114	505,290	329,890	80	337,467	443,236	194	842,757	773,126
	Totals	233	1,141,282	678,488	176	846,910	1,262,440	409	1,988,192	1,940,928
February	American	97	486,186	325,835	82	422,871	633,458	179	908,673	959,293
	Foreign	78	354,190	237,604	69	266,300	366,381	147	620,874	603,985
	Total	175	840,376	563,439	151	689,171	999,839	326	1,529,547	1,563,276
January	American	88	450,254	313,094	67	320,300	462,245	155	770,554	775,339
	Foreign	106	473,524	285,649	91	366,614	530,944	197	840,138	816,593
	Total	194	923,778	598,743	158	686,914	993,189	352	1,610,692	1,591,932
1922										
December	American	78	363,857	328,924	68	344,847	551,907	146	710,704	880,831
	Foreign	83	352,020	231,494	75	312,539	422,777	158	664,559	654,271
	Total	161	717,877	560,418	143	657,386	974,684	304	1,375,263	1,535,102
November	American	65	324,783	234,500	55	273,293	416,515	120	598,076	651,015
	Foreign	83	370,180	266,878	91	369,024	508,967	174	739,204	775,845
	Total	148	694,963	501,378	146	642,317	925,482	294	1,337,280	1,426,860
October	American	70	328,229	264,171	51	250,606	385,196	121	578,835	649,367
	Foreign	89	384,223	300,904	84	347,334	495,592	173	731,557	796,496
	Total	159	712,452	565,075	135	597,940	880,788	294	1,310,392	1,445,863
September	American	54	260,249	226,741	53	235,008	315,898	107	495,257	542,639
	Foreign	72	322,167	241,095	61	252,986	354,454	133	575,153	595,549
	Total	126	582,416	467,836	114	487,994	670,352	240	1,070,410	1,138,188
		Vessels in Ballast								
1923										
October	American	73	443,618	0	2	3,165	0	75	446,783	0
	Foreign	17	77,706	0	2	4,903	0	19	82,609	0
	Totals	90	521,324	0	4	8,068	0	94	529,392	0
September	American	59	352,792	0	1	5,233	0	60	358,025	0
	Foreign	19	85,041	0	3	12,121	0	22	97,162	0
	Totals	78	437,833	0	4	17,354	0	82	455,187	0
August	American	82	477,284	0	2	6,073	0	84	483,357	0
	Foreign	24	100,910	0	3	9,581	0	27	110,491	0
	Totals	106	578,194	0	5	15,654	0	111	593,848	0
July	American	76	443,654	0	4	12,848	0	80	456,502	0
	Foreign	25	107,103	0	3	9,580	0	25	116,683	0
	Totals	101	550,757	0	7	22,428	0	105	573,185	0
June	American	70	422,173	0	0	0	0	70	422,173	0
	Foreign	27	118,540	0	2	7,255	0	29	125,795	0
	Totals	97	540,713	0	2	7,255	0	99	547,968	0
May	American	72	422,947	0	3	10,658	0	75	433,605	0
	Foreign	23	87,784	0	2	4,750	0	25	92,534	0
	Totals	95	510,731	0	5	15,408	0	100	526,139	0
April	American	67	393,895	0	3	18,837	0	70	412,735	0
	Foreign	11	44,214	0	2	9,412	0	13	53,626	0
	Totals	78	438,109	0	5	28,249	0	83	466,358	0
March	American	60	359,006	0	4	7,841	0	64	366,847	0
	Foreign	35	144,223	0	3	9,915	0	38	154,138	0
	Totals	95	503,229	0	7	17,756	0	102	520,985	0
February	American	36	229,578	0	0	0	0	36	229,578	0
	Foreign	24	105,848	0	3	7,486	0	27	113,334	0
	Total	60	335,426	0	3	7,486	0	63	342,912	0
January	American	29	181,617	0	2	10,141	0	31	191,758	0
	Foreign	26	109,586	0	1	4,942	0	27	114,528	0
	Total	55	291,203	0	3	15,083	0	58	306,286	0

Late Flashes On Marine Disasters

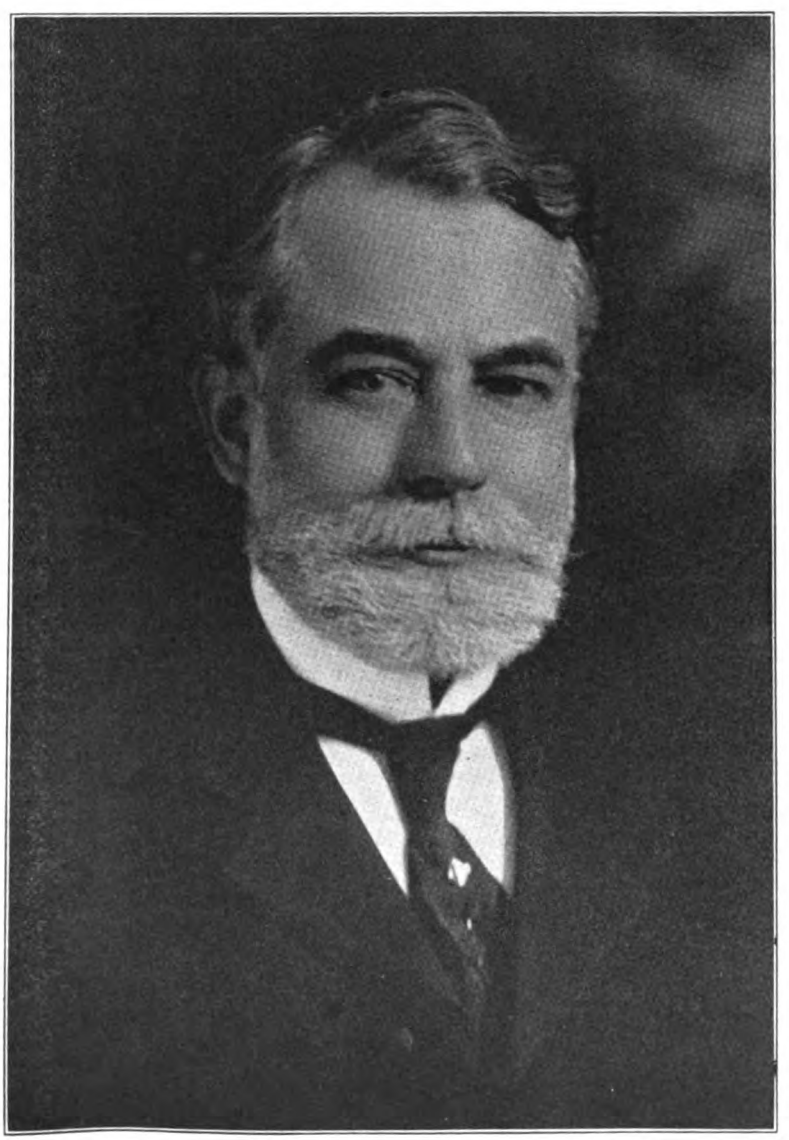
Brief Summaries of Recent Maritime Casualties— A Record of Collisions, Wrecks, Fires and Losses

Name	Date	Nature	Place	Damage Resulting
A. & W. Ogilvie	Nov. 6	Col. w. float wreck	Lornville	Leaking
Anchor Light	Nov. 9	Fire	New York	Slight
Anna O'Connor	Nov. 14	Fire	New York	Not stated
Ada A. McIntyre	Nov. 1	Ashore	Schoodic Island	Badly broken up
Angleterre	Nov. 5	Grounded	nr. Nassau	Total loss
Arthur H. Zwicker	Nov. 14	Fire	Brooklyn	Eng. room
Atlantic	Nov. 14	Disabled	Delaware Breakwater	Not stated
Aymeric	Nov. 22	Touched ground	Junin	Damaged
Abbie S. Walker	Nov. 27	Grounded	Lynn	Undamaged
Barge No. 94	Nov. 10	Grounded	abv. Southwest Spit	Floated
Buyo Maru	Nov. 30	Fire	Algiers	No. 2 hold
Cataract	Nov. 12	Collision	Welland Canal	Not stated
Commercial Scout	Nov. 5	Collision	Sandy Hook	Leaking
Camilla Gilbert	Nov. 6	Stranded	off Norskaer	Not stated
Cliffwood	Nov. 8	Collision	New Orleans	Hole abv. w. l.
City of Orleans	Nov. 13	Abandoned	Fenwick Island	Sunk
Calcite	Nov. 20	Stranded	op. Corsica shoals LS	Released
Catherine M. Moulton	Oct. 30	Disabled	Yarmouth, NS	Leaking
Charles Groth	Nov. 21	Fire	New York	Slight
City of Grandhaven	Nov. 18	Fire	Sheboygan	Cabin destroyed
Chickasaw	Nov. 24	Disabled	Sandy Hook	Sl. Eng. trouble
Clavarack	Nov. 26	Collision	River Thames	Damaged
Cristobal	Nov. 22	Ashore	N of Jensen, Fla.	Leak. aban.
Dorothy L. Bill	Nov. 4	Fire	off Lockport	Fire, lost
Durham	Nov. 19	Disabled	off Swansea	Steerer dis.
El Dio	Nov. 5	Collision	Sandy Hook	Damaged
Elizabeth Bandi	Nov. 11	Disabled	Charleston	Broken windlass
El Mar	Nov. 10	Disabled	Norfolk	Not stated
Empire	Nov. 16	Foundered	Cleveland	Wrecked, floated
Elizabeth Howard	Nov. 8	Not stated	off Porters Island, NS	Lost
Eureka	Nov. 20	Not under control	off Highlands	Not stated
E. W. Oglebay	Nov. 30	Grounded	Rockport	Released
Esther	Nov. 24	Disabled	St. Thomas	Leak. badly
Esther Dollar	Nov. 25	Fire	at Sea	Water damage only
Edward B. Winstow	Nov. 28	Hurricane	150 m. off Mexico	Leak., jibs & spanker gone
Eloisa Y. Maria	Nov. 15	Storm	off Grand Cayman Island	Total wreck
Esther K.	Nov. 23	Storm, leak.	St. Thomas	Some sails gone
F. L. Robbins	Nov. 6	Grounded	nr. Tail Point	To 23 plates
F. G. Hartwell	Nov. 16	Lost anchor	Hay Lake	Not stated
F. S. Loop	Nov. 15	Collision	off Morristone Point	To stem, hawse pipe & leak.
Gen. Garretson	Nov. 14	Fog, grounded	St. Marys River	Undamaged
Glenstriven	Nov. 17	Ashore	Georgian Bay	Heavy
Grete	Nov. 10	Fire	Staten Island	Slight
General Milne	Nov. 12	Grounded	nr. Cape La Roche	Holds fl'd'd.
Grace M. Pendleton	Nov. 17	Stranded	nr. Cuxhaven	Wrecked
Glenburnie	Dec. 1	Ashore	Darsh Island	3 tanks pun.
Glen Ridge	Nov. 26	Ashore	Not stated	Undamaged
Gulfprince	Nov. 28	Grounded	Bel. Reedy Island	Undamaged
General Jacobs	Nov. 23	Ashore	Burin	Damaged
Hertha	Nov. 9	Collision	Lynhaven Roads	Not stated
Herbert L. Pratt	Nov. 15	Collision	nr. Bombay Hook	Not stated
Humaconna	Nov. 14	Disabled	Shinkoku	Drifting
Huron	Nov. 28	Lost Anchor	Cleveland	Not stated
Helge	Nov. 28	Fire	New Orleans	To cargo
Invincible	Nov. 1	Fire	San Diego	Total loss
Indiana	Nov. 5	Ashore	Ensenada	Pound. to pieces
International	Nov. 14	Disabled	off Pollock Rip	Not stated
John B. Ketchum	Nov. 12	Collision	Welland Canal	Heavy
Joseph Clark	Nov. 21	Fire	New York	Slight
James Barber	Nov. 19	Leaky cond.	off Cape Elizabeth	Dismantled
J. C. Donnell	Dec. 3	Disabled	Savannah	Prop. blade broke
Kroonland	Nov.	Struck obj.	San Pedro	Twisted prop. blades
Kranos	Nov. 15	Exp. believed by mine	Baltic	Sunk
Kamouraska	Nov. 25	Stranded	Cape St. Michel	Undamaged
Labette	Oct.	Grounded	Hayti	Damaged
Lochinvar	Nov.	Fog & gales	at Sea	Lost
Lydia McL. Baxter	Nov. 9	Collision	Lynhaven Roads	Sunk, floated
Lewiston	Nov. 29	Ashore	Kelleys Island	Not leak
Leeds City	Nov. 27	Fire	Port Arthur	In bunkers
Michigan Central	Nov. 8	Abandoned	E of Thunder Bay L.	Towed in
Mayarit	Nov. 5	Disabled	off San Diego	Pump trble.
Melita	Nov. 4	Hvy. weather	Montreal	Tailshaft damaged
Meanticut	Nov. 7	Grounded	Pensacola	Not stated
Mongah	Nov. 8	Collision	New Orleans	Not stated
Martinique	Nov. 10	Col. with dock	St. Thomas	Undamaged
Maiden Creek	Nov. 3	Disabled	Mobile	Not stated
Milton	Nov. 13	Disabled	off Cape Race	Shaft brok'n
Marion Oboyle	Nov. 12	Struck shoal, capsized	Ewes, Del.	Sunk
Mary G. Maynard	Nov. 11	Disabled	Halifax	Sails dam.
Maine	Nov. 16	Disabled	San Francisco	Machy. trouble
Mary Winkelman	Nov. 19	Ashore	Pago Pago	Total loss
Miskianza	Nov. 10	Unknown	Bermuda	Unknown
Miraflores	Nov. 18	Disabled	off Georgia coast	Eng. & fire rms. fl'd'd
Mary C. Elphicke	Nov. 30	Grounded	nr. Tashmoo Park	Released
Mevania	Dec. 5	Collision	off New York	Consider'le
Nordhav	Dec. 5	Collision	Buttermilk Channel	Heavy
Oriole	Nov. 22	Fire	New York	Slight
Olivia May	Nov. 14	Ashore	Crockers Cove	Total wreck
Ottar	Nov. 21	Disabled	Newport News	Slight
Otterburn	Nov. 23	Explosion, fire	off Marseilles	Heavy
Pocone	Nov. 8	Disabled	Bermuda	Rudder gone
Princess May	Nov. 8	Disabled	Kingston	Boil. def.
Peter McIntyre	Nov. 15	Collision	nr. Bombay Hook	10' hold, sunk to wateredge
Princess Alice	Nov. 15	Collision	off Morristone Point	Undamaged
Pocone	Nov. 28	Ashore	Sandy Hook	Windlass broke
R. J. Reiss	Nov. 7	Grounded	Cheboygan Point	Undamaged
R. P. Ranney	Nov. 8	Log in wheel	Outer Island	To wheel & shoe
Ripple	Nov. 8	Disabled	Bermuda	Minor mach. defects
Romsdalshorn	Nov. 14	Disabled	Callao	Prop. dam.
Rosa Ferlita	Nov. 13	Disabled	Newport News	Not stated
Rask	Nov. 8	Disabled	Bermuda	Eng. dam.
River Wye	Nov. 24	Ashore	Port Mounton Island	Total loss
Red Bird	Nov. 30	Disabled	Havana	Prop. blade broke
Robin Gray	Dec. 1	Broke chain, ashore	off Presidio	Undamaged
Svanhild	Nov. 8	Disabled	at Sea	Rudder stock brke.
Seneca	Nov. 6	Disabled	at Sea	Not stated
Sterling	Oct. 6	Not stated	off Panuco Point	Foundered
Storm King	Nov. 13	Disabled	at Sea	Proceeded
San Gil	Oct. 23	Grounded	Caribbean Sea	Damaged
Sagua	Nov. 15	Grounded	off Corn Islands	Bot. dam.
Steel Navigator	Nov. 16	Water in hold	Alexandria	Cons. to cargo
Selma City	Nov. 20	Ashore	at Sea	Undamaged
Suruga	Nov. 19	Collision	Singapore	Damaged
Sudutfco	Nov. 20	Grounded	Ambrose Channel	Not stated
Sagaporack	Nov. 21	Leak. in hold	London	To cargo
Sallust	Nov. 22	Disabled	Bermuda	Crank shaft dis.
Safety	Nov. 23	Collision	Bayonne, N.J.	Sunk
Shinkoku Maru	Nov. 26	Ashore	nr. Montague Island, Alaska	May be total loss
Samaria	Dec. 1	Fire	New York	Slight
Storm King	Nov. 24	Collision	Brunswick	Slight
Seminole	Dec. 5	Collision	off New York	Consider'ble
Thistlemore	Nov. 12	Disabled	Queenstown	Cir. pump dis.
Tancarville	Nov. 20	Not under control	Reedy Island	Not stated
Thomas Jefferson	Nov. 28	Fire	New York	Consider'le
Toledo	Dec. 2	Struck pier	Erie Harbor	Heavy
U. S. Engr. No. 444	Dec. 1	Fire	New York	Slight
U. S. Engr. No. 26550	Dec. 1	Fire	New York	Slight
W. G. Pollock	Nov. 15	Disabled	Isle Royal	Lost prop. wheel and eng. dis.
W. R. Linn	Nov. 15	Hit by bridge	Cuyahoga River	Lost foremast
Wakefield	Nov. 10	Fire	Tombigbee River	Total loss
William B. Diggs	Nov. 13	Abandoned	off Barnegat	Picked up & towed in
West Keene	Nov. 22	Collision	Santos	Slight
Westerian	Dec. 2	Hvy. weather	off St. Johns	Badly dam.
West Nohno	Dec. 5	Collision	Buttermilk Channel	Slight
Zeelandia	Nov. 22	Collision	Santos	Slight

Antonio C. Pessano, 1857-1923

ANTONIO C. PESSANO, who for more than 20 years had been in the foreground of American shipbuilding and engineering, died at New York on Dec. 5. He was 66 years old. He was chairman of the board of directors of the Great Lakes Engineering Works which operates shipyards at Detroit and Ashtabula, O. Death resulted from heart failure preceded by a cold. At the time, he was in his apartments in the Hotel Plaza, New York, where he has lived for some time. Funeral services were held Dec. 8 in Philadelphia, his earlier home and birthplace. All plants and offices of the Great Lakes Engineering Works were closed at that time in memory of the man who had been its chief executive from the organization of the company. Mr. Pessano was born in Philadelphia, July 3, 1857. His parents were Antonio D. and Elizabeth Ogden Pessano. His education was carried out at the Philadelphia schools and later at the Franklin Institute of Technology. On Sept. 22, 1880 he married Miss Elizabeth A. Walker of Philadelphia. His wife survives him. His entrance into the shipbuilding business took place in the spring of 1902. John R. Russel of the Russel Wheel & Foundry Co., organized the Great Lakes Engineering Works to take over the business of S. F. Hodge & Co., Detroit. This was an old established engine and boiler manufacturer, which had begun business in 1863 as Cowie, Hodge & Christie, changed in 1865 to Hodge & Christie, Mr. Samuel F. Hodge becoming sole proprietor a few years later. Associated with Mr. Russel were H. W. Hoyt, vice president of the Allis-Chalmers Co., Milwaukee; Mr. Pessano, brought on from Philadelphia; George H. Russel and John A. Penton, of the Penton Publishing Co. Mr. Pessano had established a record as vice president and general manager of the George V. Cresson Co., Philadelphia, which had won the attention of Mr. Russel and his associates. He had taken part in the purchase of the Hodge company and upon organization of the Great Lakes company, he was made president and general manager.

While the new company continued the old line of manufacture, such as marine and stationary engines, marine pumps and condensers, mining machinery, propeller wheels and general foundry jobbing work, the decision was quickly reached to take up shipbuilding. The first vessel built was the R. W. ENGLAND, launched in May, 1904. The company soon became a leading factor in lake shipyard work, a position which has been steadily maintained. In the same year as the first launching, the company bought the Columbia Iron Works at St. Clair, Mich. In 1909, the decision was made to build a plant at Ashtabula, O. This site was selected because of its good location for obtaining repair work and because of favorable local conditions. In equipping this plant, any equipment of value was moved to Ashtabula from the old St. Clair plant, and the latter abandoned. The company's yards, both at Ecorse (Detroit) and Ashtabula, have been enlarged in recent years and kept thoroughly modern. Mr. Pessano in the judgment of many of his associates, was one of the most successful salesmen in the country. Originally he had not had a technical mastery of the shipbuilding business but he was surrounded with a group of competent experts. He was able to obtain contracts for the new yard while making sure that the ships were built in such a manner as to win the satisfaction of the owners. About the time of the entrance of this country into the war, Mr. Pessano had won the right to a measure of relief from active control at the plants, and began to spend more time in the east. He had been made chairman of the board of directors. In the east, since that time, he has kept actively in touch with marine affairs both in a business way and in technical work. He was a member of the Society of Naval Architects and Marine Engineers, American Society of Mechanical Engineers, National Association of Manufacturers, Detroit Engineering society. For years both before and after his association with the Great Lakes Engineering Works, he had been active in the National Founders' association.



ANTONIO C. PESSANO
For 20 years head of the Great Lakes Engineering Works

Less Foreign Trade Is Carried in U. S. Ships

The United States moved 45.5 per cent of its total water-borne foreign trade commerce in vessels of American registry during the fiscal year ended June 30, 1923, according to a statement issued by the bureau of research of the shipping board. This represents a slight falling off from the figures for the calendar year 1922, when American ships carried 51 per cent of the total water-borne foreign commerce. Measured in terms of long tons of 2240 pounds, the water-borne foreign commerce for the fiscal year reached the total of 93,000,000 tons, almost exactly divided between imports and exports. American ships carried 55 per cent of the total import trade of 46,151,798 tons and 36 per cent of the total export trade of 46,805,784 tons. Of the total traffic, vessels of the shipping board carried approximately 11,000,000 tons or 12 per cent of the total.

Excluding the commerce moved by Great Lakes vessels between the United States and Canada, the water-borne foreign trade amounted to 79,700,000 tons, of which American ships carried 41.5 per cent, divided, 51 per cent of imports and 31 per cent of exports, the import trade exceeding the export trade by 3,300,000 tons. Of the 33,000,000 tons moved in American bottoms, 22,000,000 tons moved in privately owned vessels and 11,000,000 tons in shipping board vessels. These figures, however, include the activities of the tank ship fleet engaged in moving petroleum in bulk. If this movement be deducted in order to arrive at the movement in general cargo ships, it is found that the shipping board moved 9,500,000 tons against 8,300,000 tons transported by privately owned American vessels.

Leaving out the Great Lakes, the principal imports for the fiscal year were: petroleum, 15,000,000 tons; coal, 4,500,000 tons; sugar, 3,500,000 tons; iron ore, 2,500,000 tons; and lumber and nitrates, 1,000,000 tons each. During the same period, the following principal commodities were exported; all grains, 10,000,000 tons; petroleum and its products, 9,750,000 tons; lumber, 3,500,000 tons; coal, 3,000,000 tons; flour, 1,500,000 tons; machinery and steel manufactures, 1,500,000 tons, and cotton and fertilizers, 1,000,000 tons each.

This shows imports of 4,500,000 tons of coal and, exports of 3,000,000 tons. The former figure is largely due to the movement during the coal strike in this country in the spring and summer of 1922, because of which it was necessary to import great quantities of bituminous coal during the fall. The export movement, on the other hand, was caused by the disturbed conditions in the coal mining districts of Europe, which caused the continental nations to buy on this side in greater quantities than would be normal.

The magnitude of the trade in oil is indicated by the figures which show that it forms the basis of more than one-fourth of the total movement in foreign trade by water. As the foregoing data, of course, do not take into account the coastwise trades, which support a considerable fleet and which are reserved to American flag vessels by statute, this, of course, leaves out the large quantities of oil now being moved in the intercoastal trade.

Save Mileage by Study of Ship Routes

BY PETER AIKENS

THE feature brought up in this article, while perhaps a small factor in the preparation of itineraries for a majority of runs, none the less constitutes in certain instances a source of further economy to an extent varying from one to two days' time and a corresponding reduction in operating costs of a ship.

The subject lends itself much more readily to illustration than to explanation. Assume that you contemplate engaging in trade where cargo is to be carried on a number of consecutive runs from Vera Cruz to Halifax; and at the same time trade from Callao to Havana via Panama is being similarly arranged for.

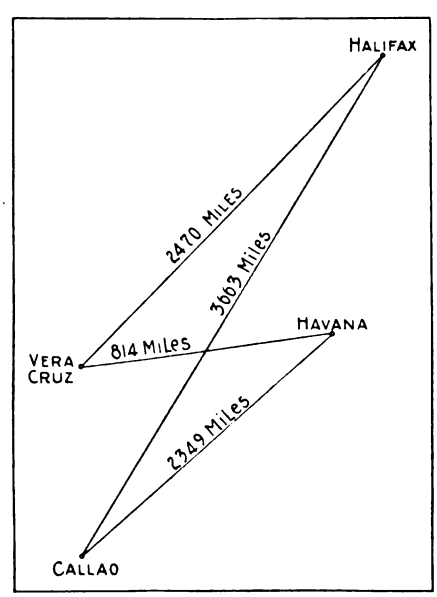
The surface indication is at once to put a vessel on each run; one between Vera Cruz and Halifax, and the other between Callao and Havana. Provided, of course, that both vessels are fitted so that it is optional to which trade each will be assigned, this given illustration develops a second possibility, to rearrange the voyage loaded from Vera Cruz to Halifax for discharge, followed by trip in ballast to Callao for cargo, which is dropped at Havana, from where ship proceeds light to Vera Cruz; and to place both vessels on that run.

According to the route first suggested, namely each on a separate run, the distance would total this way:

(A) First ship, two round trips from Vera Cruz to Halifax, 9880 miles.

Second ship, two round trips from Callao to Havana, 9396 miles.

Total distance on two round trips, would consequently reach 19,276 miles.



HOW VESSEL WAS REROUTED TO SAVE MILEAGE

The second layout would give the following results:

(B) First ship, one round trip from Vera Cruz to Halifax, Callao, Havana and return to Vera Cruz, 9296 miles.

Second ship, exactly same run, 9296 miles.

Total distance on two round trips, 18,592 miles.

Distance saved by plan (B) 684 miles on two round trips.

To divide the 684 miles saved by the ships' speeds respectively, for each ship would save half this distance, 342 miles, will give the time saved by each vessel on two round trips. To multiply the time saved by the daily operating cost of each ship will give the monetary saving.

To complete the illustration, assume that the first ship has a speed of 9 knots per hour and that its operating costs are $900 a day. The second ship, for instance, runs at 9.5 knots per hour and its operating costs are $975 per day.

According to the foregoing, the first ship would save 1.6 days and $1260; the second ship would save 1.5 days and $1462.50. The total saving would be $2722.50 on the two round trips, be-

sides advancing the schedule of each vessel by a day and a half.

The one instance given serves to adequately illustrate the point. This suggestion is a matter of vital importance in preparing a certain class of layout, for certainly there are cases where its application has a decided advantage in paring down the operating costs and favorably accelerating the schedule; two things really worth effort, particularly when the waves of competition roll high as they do today.

Liner Captain Retires

Capt. Adrian Zeeder, commander of the liner MANCHURIA of the American line is soon to retire after 50 years of service at sea, a service which spans the period between the heyday of the famous clipper ships of the seventies to the crack ocean liners of the present day. The captain recently arrived in New York from Plymouth, but did not return there in command. Captain Zeeder before his retirement, however, will make one more trip in command of the MANCHURIA and that will be when this ship enters on the New York-San Francisco service via the Panama canal. The highest hopes for the success of this service are entertained by him.

For the last eight years, Captain Zeeder has been engaged in the Atlantic trade, and during the war he made frequent trips to Plymouth with munitions, successfully escaping several enemy torpedo attacks. That the sea gets under the skin and into the blood of the real sailor man is indicated by the fact that though he has traveled during the course of his career about 2,500,000 miles in steamships, Captain Zeeder will not finish with the sea on his retirement, as his immediate future plans include a world tour. On the occasion of his last holiday, 15 years ago, he spent six months sight seeing, traveling 48,000 miles on the ocean.

E. E. Helm has been appointed district manager at Detroit of the Bridgeport Brass Co., Bridgeport, Conn. For two years he was manager of the industrial bureau of the Akron, O., chamber of commerce. For five years previously he was with the Goodyear Tire & Rubber Co., Akron, in advertising and publicity work.

Marked improvement in the terminal facilities of Tacoma is planned through a proposed belt line railway to be built through the industrial section close to the deep sea piers. Three transcontinental railroads have accepted the plans proposed by the city.

In the North Atlantic

BALTIMORE'S second trade mission to the west returned late in November greatly encouraged by the results of the trip. Grand Rapids, Fort Wayne, Louisville, Richmond and Milwaukee were visited this time.

* * *

Up to the latter part of November, customs collections at Baltimore amounted to $11,588,290.61 for 1923. This is a 200 per cent increase over last year,

CAPT. ADRIAN ZEEDER

when collections for the same period were placed at $4,493,314.43.

* * *

The Garland line has announced that in March, 1924, it will withdraw its intercoastal service from Baltimore and the Atlantic and concentrate on the Pacific-Oriental trade. Meanwhile shipments to the Far East will be accepted by this company at Baltimore.

* * *

The Porto-Rican freight conference has been reorganized and effective Feb. 18 will put into effect a general 15 per cent increase in rates. The new rates, however, will be below those quoted before the recent rate war in this trade. The Porto Rico-American Steamship Co. from Baltimore has changed its sailing day from Friday to Wednesday, with deliveries at San Juan on Tuesday.

* * *

Coal exports from Baltimore during November totaled 48,568 tons. Italy was the largest buyer, followed by France, Argentina, Cuba, Canada and Porto Rico. One cargo of 4050 tons of coke went to Chile. Bunker coal at that port is now quoted at $4.60 gross ton piers.

* * *

Grain exports from Baltimore for November amounted to 1,914,992 bushels, 1,735,864 bushels of which were wheat. Barley, rye and oats also moved. From Jan. 1 to Nov. 30, grain exports amounted to 40,007,419 bushels as compared with 82,695,521 bushels for the same period of last year.

* * *

Import coffee at Baltimore up to December, 1923 had already reached 169,062 bags with enough enroute to bring the total over 200,000 bags for the year. In 1922, coffee imports totaled 132,192 bags. More Baltimore coffee is moving west.

* * *

The South Atlantic ports have petitioned the interstate commerce commission for a reduction in the import rail rates granted them to Central Freight association territory. They desire the Baltimore and Norfolk basis. Intervening petitions have been filed by Baltimore interests.

* * *

Foreign trade vessel entrances at Baltimore during November totaled 90 vessels of 280,617 net tons and clearances 91 vessels of 279,278 net tons. November 1922 entrances were 114 vessels of 361,162 net tons and clearances 132 vessels of 403,593 net tons.

* * *

Imports through Baltimore are growing. More high value dutiable cargo is arriving and bulk shipments are increasing. Large tonnages moving include oil, coffee, sulphur, wood-pulp, ores, sugar, bananas, print paper, rags, molasses, lumber and chemical materials.

* * *

Total activities in Baltimore's coastwise and intercoastal trade for November were as follows: entrances, 162 vessels of 421,886 net tons; clearances, 205 vessels of 488,980 net tons.

* * *

Contract has been awarded the Continental Cargo Checking Co. by the shipping board to perform all tallying and checking on shipping board vessels arriving at Boston for the next six months, other than vessels on bareboat charter.

* * *

General agent C. H. Weeks of the Coastal Steamship Corp. has announced the appointment of Samuel J. Power as port agent of that company with offices at Battery Wharf, Boston.

* * *

Three changes recently took place in the personnel of the marine division at the custom house, Boston. George R. Starkey, who had been coastwise entry and clearance clerk for the past six years, joined the staff of the liquidation division. Joseph L. Van Steenburgh, export clerk, succeeded to the position vacated by Mr. Starkey, and James Burke becomes export clerk.

* * *

The sailing hour of the New York freight boats of the Eastern Steamship lines has been changed from 4 p.m. to 5 p.m. and vessels leave promptly on their sailing hour.

* * *

The sea service bureau of the shipping board in charge of Harrington Pike,

is now located in new quarters at 30 India street, Boston.

* * *

The steamer LEVIATHAN will be withdrawn from service for a few months this winter and after overhauling at her Hoboken pier, will be brought to Boston, probably in February, for drydocking in the Commonwealth drydock, South Boston.

* * *

A co-operative office of the bureau of foreign and domestic commerce has been opened in Springfield, Mass., at the chamber of commerce with Benjamin A. Hapgood in charge.

* * *

According to the latest reports of the American bureau of shipping 17 vessels aggregating 100,033 gross tons were building and contracted for in United States shipyards on Nov. 1.

* * *

George H. Woolley of the Commercial Towing Co., Boston, was re-elected president of the National Board of Steam Navigation at the annual meeting held at New York recently.

* * *

The Chicago & Eastern Illinois railroad recently opened an office in Boston at 328 Old South building, in charge of Joseph J. Davitt as general manager.

* * *

Capt. J. M. Hoffman has resigned from shipping board service to become president of the newly formed Boston Tidewater Terminal Co. He began his new duties Dec. 1.

From the South Coast

CUSTOMS officials at Galveston, Tex., put to sea Nov. 23 and seized the British schooner ISLAND HOME with 865 cases of whiskey and two barrels of beer. The schooner was beyond the 3-mile limit. Complaints were filed against the master and eight members of the crew. This is the largest liquor seizure made by officials of the port this year.

* * *

The Texas Sugar Refinery, a $5,000,000 project located at Texas City, Tex., will be ready for operation early in 1924. The refinery is located on the waterfront and a cargo of Cuban sugar a week will be handled.

* * *

With the arrival of the Norwegian steamer VINDEGGEN with 29,950 bags of sugar, the Sugarland Industries of Sugarland, Tex., stopped their importations of Cuban sugar until after the first of the year. This cessation is for the purpose of working up the Texas cane crop which is good this year and will require about six weeks to finish.

* * *

The Triangle Intercoastal Motorship Line, Galveston, Tex., inaugurated its service on Nov. 20 when the motorship BETTY departed for Freeport, Matagorda, Palacios and Port Lavaca. On her return to Galveston, the BETTY made her trip to Goose Creek and return thus completing her weekly schedule which is all that is contemplated by the line at present. If business develops, other boats will be built and other cities visited to deliver and take on cargo.

* * *

According to a ruling made public in November at Houston, Tex., cotton moving to and from Houston aboard vessels which do not take a tow boat between Morgan's Point and the turning basin, will be subject to a penalty of 50 cents per $100 valuation. This new ruling by the cotton underwriters supplements other recent rulings and lends force to them by assessing a penalty for their violation.

* * *

The steamship WILLIAM CAMPION of the Garland Steamship Corp. cleared from Galveston in November with a cargo of 8000 tons of sulphur destined to San Francisco and other Pacific ports. This is thought to be the largest cargo of sulphur ever sent out of a gulf port. The Steele Steamship line was agent for the vessel and she was loaded for the account of the Texas Gulf Sulphur Co.

* * *

Capt. J. W. Munn, former head of the Gulf Fisheries Co., Galveston, has proposed to the Galveston Commercial association the establishment of a deep sea fishing company with a capital stock of $100,000. The plans are said to have met with the approval of different business men.

* * *

Exports from the district of Galveston during the month of September, 1923, jumped to a total of $83,830,797 as compared with $27,771,773 for the month of August. England was the chief purchaser with a total value of $28,727,166 in September and $3,676,562 in August: Germany was second with $15,110,714 in September, $6,189,000 in August; France came third with $13,287,701 in September; August $7,249,921; Italy was fourth with $9,226,930 in September; August $2,422,913; Spain, Japan and Belgium came in the order named, commodities valued at more than a million dollars being exported to each.

* * *

Cotton exported from the Galveston district during September, 1923 amounted to 553,519 bales valued at $80,680,815. This cotton weighed 294,307,417 pounds and figuring eight ounces to a yard of goods 588,614,834 yards could be manufactured from it. At five yards to a dress, this would provide 117,722,966 women with one good, durable dress each.

* * *

Exports of sulphur from the Galveston district during September, 1923, were 13,850 tons.

Owners of the coasting steamship RAINIER, which was so badly damaged in collision as to be a constructive total loss, have filed suit for $325,000 against Mitsui & Co., owners of the Japanese freighter MANDASAN MARU which collided with the RAINIER during a heavy fog.

National Society Offers 10 Ways to Help Ships

Preferential treatment for American ships in American trade is the keynote of the policies for dealing with the shipping problem just adopted by the governing council of the National Merchant Marine association, of which Senator Joseph E. Ransdell of Louisiana is the president.

"Government operation of the great bulk of the American merchant marine, whether direct or indirect," the association points out, "cannot solve the American shipping problem, which is to establish permanently an adequate trade fleet able to compete, under private enterprise, with the cheaper built and cheaper operated tonnage of other nations, which is carrying two-thirds of our commerce with the world."

The methods advocated by the association are given in a series of resolutions drafted at a recent meeting of the governing council and since ratified by that body. The resolutions declare as follows:

1. That the National Merchant Marine association favors private operation of American shipping and is opposed to any form of government operation.

2. That there should be prompt enforcement of Section 21 of the merchant marine act of 1920, applying the coastwise laws to insular possessions, including the Philippines; and also of Section 34 of the same act, providing for notification of an intent to modify the commercial treaties that now stand in the way of a return to preferential duties and tonnages taxes.

3. That enactment by congress is favored of legislation applying the principle of preferential duties and tonnage taxes for the encouragement of American shipping as against vessels of other nations engaged in the indirect trade.

4. That certificates should be issued to American exporters of goods of American production in American vessels, and to American importers of goods on the free list in American vessels; these certificates, which could be made negotiable and transferable, representing a percentage of the value of the goods, and ultimately to be used in the payment of customs duties.

5. That government forces and supplies should be carried in privately owned American ships, and that ocean travel by government officials and employes should be restricted to American ships, when these are available.

6. That a national policy should be adopted, reserving the transportation of as nearly as practicable one-half of the total number of immigrants admitted to the United States in any fiscal year, to vessels registered, or enrolled and licensed, under the laws of the United States.

7. That an immediate and thorough revision is recommended of the navigation laws and rules of the United States, through the co-operation of the department of commerce, the shipping board and the private shipowners and operators of the country, with prompt action by congress.

8. That there should be a closer co-ordination of rail and water transportation for facilitating the export commerce of the interior of the country, and that the association pledges its best efforts to bring about a practical working out of this policy.

9. That the officers and men of the American merchant marine should be enrolled in the naval reserve of the United States under suitable regulations as to pay, qualifications and duties.

10. That the repeal is recommended of all laws that admit foreign-built ships, including yachts, to American registry.

"Enforcement by the government of such policies as outlined above," says the National Merchant Marine association, "would assure a permanent and adequate American trade fleet for commercial and protective purposes, with a consequent expansion of our foreign commerce. The benefits provided for would accrue not only to shipping and labor, but to the American farmers and other producers, manufacturers, exporters and importers, and would end the drain on the American taxpayer caused by government operation of our ships."

Iron Ore Shipments

Shipments of 4,938,249 gross tons of iron ore from the Lake Superior district in November and of 9894 tons in December, brought the season's total movement up to 59,036,704 tons. This ranks the 1923 season as one of the best in lake history. Detailed figures by ports for the last two months and for the season, follow:

Port	Nov. & Dec* 1923	Season of 1923
Escanaba	437,711	5,607,411
Marquette	307,106*	2,789,285
Ashland	337,348	6,237,449
Superior	1,410,254	17,820,476
Duluth	1,939,122	20,163,619
Two Harbors	516,602	6,418,464
Total	4,948,143	59,036,704
1923 Increase	1,517,913*	16,423,475

*In December, 1923, one cargo of 9894 tons was shipped from Marquette.
In December, 1922, one cargo of 9626 tons was shipped from Escanaba.

Soo Canal Commerce

In November, freight passing through the canals at Sault Ste. Marie aggregated 10,705,529 net tons. As shown in the following table, this record surpasses that of any other year since 1917:

	Net tons
November, 1923	10,705,529
November, 1922	9,468,019
November, 1921	3,265,479
November, 1920	9,419,580
November, 1919	5,134,496
November, 1918	8,513,511
November, 1917	11,153,808

The table below gives the season's movement by commodities through Nov. 30. In the corresponding period of 1922, the total movement was 64,229,558 net tons against 89,621,404 net tons in 1923. The wheat movement is practically the same, but the iron ore and coal shipments have been much larger. Detailed figures follow:

EASTBOUND	
Lumber, M. Ft. B. M.	189,011
Flour, barrels	9,746,831
Wheat, bushels	241,318,507
Grain, bushels	76,761,970
Copper, net tons	57,440
Iron ore, net tons	59,176,112
Pig iron, net tons	20,444
Stone, net tons	22,720
Gen'l merchandise, net tons	60,080
Passengers, number	28,256
WESTBOUND	
Coal, soft, net tons	16,595,705
Coal, hard, net tons	1,637,106
Iron ore, net tons	169,743
Mfg. iron and steel, net tons	77,618
Salt, net tons	69,828
Oil, net tons	169,241
Stone, net tons	674,535
Gen'l merchandise, net tons	558,300
Passengers, number	28,057
SUMMARY	
Vessel passages, number	21,473
Registered tonnage, net	67,324,232
Freight:	
Eastbound, net tons	69,669,328
Westbound, net tons	19,952,076
Total freight, net tons	89,621,404

Lake Erie Receipts

November deliveries of iron ore at Lake Erie ports were 4,000,321 gross tons compared with 3,328,195 gross tons in November, 1922. Up to Dec. 1, total receipts were 44,417,303 gross tons. Detailed November figures by ports are:

Port	Gross tons
Buffalo and Port Colborne	561,165
Erie	136,155
Conneaut	849,693
Ashtabula	731,363
Fairport	226,503
Cleveland	776,063
Lorain	405,480
Huron	75,302
Toledo	139,338
Detroit	99,259
Total	4,000,321

The Lake Erie Boiler Works, Perry and Chicago streets, Buffalo, is closing up its business. This company which has manufactured marine boilers, has sold nearly all of its equipment.

The General Steamship Corp., which for three years has been operating shipping board steamers between north Pacific ports and Peru and Chile will substitute American tonnage with Norwegian vessels. Following the sale of several vessels to another line, the shipping board withdrew its tonnage from the General Steamship Corp. This company has decided to continue the service with foreign vessels.

Lake Michigan Receipts

Ports on Lake Michigan received 1,630,640 gross tons of iron ore in November against 879,960 tons in November, 1922. Up to Dec. 1, total receipts were 12,747,782 tons. November receipts distributed by ports are as follows:

Port	Gross tons
South Chicago, Ill.	824,316
East Jordan, Mich.	.....
Boyne City, Mich.	.....
Milwaukee	.....
Indiana Harbor, Ind.	197,448
Gary, Ind.	608,876
Total	1,630,640

Demand for Motorships Is Growing

Oil-burning and motor-driven ships continue to increase in popularity, according to Lloyd's Register of Shipping for 1922-23. The figures given for oil-burning steamers may be subject to some discount, according to Walter S. Tower, commercial attache at London, because of the fact that not all tonnage equipped to use oil as fuel is actually doing so. Possible interchangeability of coal and oil as fuel on many ships also makes it difficult to determine exactly how much tonnage is being operated as oil burning. The figures for motor ships are not subject to such discount.

During the year ended June 30, 1923, the tonnage of motor ships registered by Lloyd's increased from 1,542,160 to 1,668,400 gross tons. This increase of barely more than 8 per cent does not, however, fairly indicate the spreading popularity of the motor ship, which is best shown in the following quarterly returns of vessels under construction:

Quarter ended 1922	All countries All vessels gr. tons	All countries Motor ships gr. tons	Great Britain All vessels gr. tons	Great Britain Motor ships gr. tons
Sept. 30...	2,705,556	241,622	1,617,045	126,437
Dec. 31....	2,954,318	288,057	1,468,599	125,350
1923				
Mar. 31....	2,860,072	327,232	1,492,138	157,784
June 30....	2,543,856	387,936	1,337,759	221,274
Sept. 30...	2,377,697	400,860	1,271,195	254,426

While the total tonnage under construction has continued to shrink during the past year, the tonnage of motorships building has almost doubled for the world at large and has slightly more than doubled for British shipyards. As a result, motorships now represent more than 20 per cent of the work on hand for British builders, as compared with less than 8 per cent a year ago. At the same time average vessel size has increased.

Business News for the Marine Trade

Alaska Consolidated Canneries recently purchased the Anderson shipyard at Houghton Lake, near Seattle, owned by the Lake Union Drydock & Machine Works.

Bethlehem Shipbuilding Corp. plans an expenditure of about $500,000 in extending to 15,000-ton capacity its floating drydock, and also for purchase of new wharfing facilities, cranes, machine shops, etc., at its Los Angeles harbor plant.

The Philadelphia & New York Transportation Co., has been incorporated for $5000 to engage in transportation of freight, by L. C. Christy, S. B. Mackey and C. B. Cutter.

Public Service Shipping Co., Wilmington, Del., has been incorporated to own and operate boats, with $1,000,000 capital.

Davis Transportation Lines, Inc., Dover, Del., has been incorporated for $350,000 to operate and own steamships, by Harry C. Hand, George V. Reilly, and Robert K. Thistle, all of New York.

Massachusetts Barge & Transportation Co., Boston, has been incorporated for $10,000 by John A. York, Brookline, Mass. Rebecca S. Robinson, Boston, and Robert B. Mount, Reading, Pa., to engage in water transportation.

The Argosy Transportation Co., Inc., Boston and New York, has been incorporated for $1,000,000 to engage in shipping industry, by James B. Mahoney, Belmont, Mass.; Frederick W. Stone, Newton, Mass., and Leroy P. Edwards, Sharon, Pa.

Yangtse Rapid Steamship Corp., Wilmington, Del., has been incorporated for $210,000 to own and operate boats of all kinds.

Seaboard Shipping Corp., Wilmington, Del., has increased its capital stock from $6000 to $16,000.

The Madden yard at Sausalito, Cal., has contract for constructing 65-foot diesel driven trawler for International Fish Co., San Francisco.

All public docks in Vancouver harbor, Vancouver, B. C., have been taken over by the Vancouver harbor board.

The General Cargo Surveying & Appraisals Co. was incorporated recently at San Francisco to specialize in general and particular average surveying. It will maintain a special department for the inspection of enamel ware and cast iron pipe.

George Lunham of the Lunham & Moore Co., New York, and Theodore E. Reeve of the Reeve Shipping Co. have formed an organization under the name Lunham & Reeve, 42 Broadway.

The Hasell street dock of the Seaboard Air Line, Charleston, S. C., has been taken over by Frederick Richards, forwarding agent and customs broker of Charleston. Although the pier is already equipped with automatic handling machinery some additional improvements are to be made.

Raymond Concrete Pile Co., New York, has been awarded contract for constructing 417x650-foot pier at Charleston, S. C. for the port utilities commission. The contract price was $560,000.

Following the recent dissolution of Sudden & Christensen, San Francisco, lumber and shipping company, two new companies were formed, Sudden & Christensen taking the lumber properties, the shipping agencies and three of the lumber steamers and the Sudden & Heitman Lumber Co., capitalized at $2,500,000 taking the retail lumber yards, three lumber steamers and $1,000,000 cash consideration.

Business Changes

Capt. J. L. Murphy and A. J. Blom have organized the firm of Murphy & Blom, Inc., with offices at 131 States street, Boston, to engage in the business of ship brokerage, chartering and agency of all kinds of sailing and steam vessels.

* * *

W. M. Munroe & Co., ship brokerage and chartering firm, have moved their offices from 46 Clinton street to 214 State street, Boston.

Contract for reconditioning the steamers CANTIGNY, MARNE and TOURS, was awarded the Federal Shipbuilding Co., Kearny, N. J., on a bid of $1,004,650.

Staten Island Shipbuilding Co. was awarded contract for reconditioning the OURCQ on a bid of $389,500.

Brooklyn navy yard, Brooklyn, N. Y., was awarded the contract for reconditioning the AISNE, on a $390,000 bid.

Pacific Steamship Co. has purchased the cargo liner NANKING, formerly of the China Mail Steamship Co., at a stated price of $75,000. The ship was originally launched as the CONGRESS by the New York Shipbuilding Corp., Camden, N. J.

Coal Ports Transportation Corp., New York, has been incorporated for $10,000 to engage in transportation and navigation, by H. V. Boyle, A. E. Flanders, and J. A. Sheridan.

Commercial Courier Steamship Co., Ltd., has been incorporated for $100,000 by Wallace Ingraham, New York; James T. Tully, and Lynn P. Reed.

McDowell Marine Engine Co., Wilmington, Del., has been incorporated for $2,500,000.

Flexible Buck Anchor Corp., Philadelphia, has been incorporated for $25,000 by Peter Gombert, Pittsburgh, and T. C. Schenk, Bridgeville, Pa.

The Merchants & Shipping Insurance Co., New York, has increased its outstanding capital stock from $200,000 to $250,000.

The Central Fruit Co., Wilmington, Del., has changed its name to the Standard Fruit & Shipping Co.

The city of Seattle bought the Skinner & Eddy shipyard plant at Seattle on Nov. 23 at a reported cost of $600,000. The equipment was withheld and will be sold later by competitive bids.

The United States navy collier VULCAN was offered for sale at public auction Dec. 12 at Norfolk. The VULCAN was built in 1909 and registers 8100 deadweight tons.

Joseph F. Boyle representing a new York stevedoring company, bought the four-masted schooner LYDIA MCLELLAN BAXTER on Nov. 28 at United States marshal's sale at Newport News, Va., for $8600.

The Transmarine Line, maintaining weekly service between Port Newark, N. J., and Port Arthur, Tex., announced recently that it would move its southern terminals and headquarters from Port Arthur to Beaumont on the Neches river.

Norfolk has authorized its city manager to proceed with extensions of piers of the Old Dominion Steamship Co. about 25 feet to accommodate new ships. The bids for laying foundations have been taken and the work let to Nichols & Lindeman for $290,000.

Todd Shipyards Corp. has been awarded a contract by the Southern Pacific Co. for construction of combination freight and passenger ship to cost about $2,000,000. The vessel is to be 445 feet overall length, 57 feet of beam and have a loaded draft of 25 feet. She will have 7000 tons deadweight carrying capacity.

Newport Packing & Transportation Co., Wilmington, Del., has been incorporated for $3,000,000 to handle fishing and sea product vessels, etc.

Douglas Steamship Co., New York, has been incorporated for $5000 by J. Yuebele, J. Natale, and J. G. Douglas. L. Schehr, 215 Montague street, Brooklyn, is attorney.

Callaghan Transportation Corp. has purchased from the Fair Oaks Steamship Corp. the schooner PERRY SETZER, 1268 tons.

Lee Transit Corp., New York, has been incorporated with 800 shares no par value stock for purposes of navigation, by R. T. Mount, W. Pyne and J. K. Innes.

Hughes Bros. Transportation Co., Brooklyn, N. Y., has been incorporated with 150 shares common stock, no par value, by H. J. Frey, J. D. Armstrong, and E .J. Connolly, 189 Montague street, Brooklyn, as attorney.

Aetna Automatic Oil Burner Co., New York, has been incorporated for $2,000,000 to manufacture and deal in oil burners, by D. J. Deasy, E. Celler and J. Schmeniger Jr. Celler & Kraushaar, 51 Chambers street, New York, are attorneys.

The Richmond Operating Corp., New York, has been incorporated for $1000 to do a stevedoring business by A. A. Close, J. V. Kilroe and A. L. Tyler.

Mormack Transportation Co., Wilmington, Del., has been incorporated for $1,500,000 by James A. McDavid Stanley Safreed, Clayton C. Wright, and Harry F. Martin, all of Pittsburgh, to operate vessels.

Marine Supply Co., 22 South Water street, Wilmington, N. C., has increased its capital stock from $10,000 to $75,000 and will conduct a general ship chandlery and marine supply business. S. F. Garrison is manager.

The Rhinelander Boat Co., Rhinelander, Wis., has been incorporated with $50,000 capital stock to take over a partnership of similar name. The factory is being enlarged to increase the output of boats from 1500 to 2000 a year. Additional machinery is being purchased for wood and metal working purposes.

New Trade Publications

JACKLIFTS—The Lewis-Shepard Co., Boston, has published a circular describing jacklifts, wood and metal leg platforms, singlelifts, self-loading trucks and stackers. Each machine is pictured separately to show its application.

TACHOMETERS—Recording, indicating and combination unit tachometers are illustrated and described in a bulletin published recently by the Bristol Co., Waterbury, Conn. The field of usefulness of each instrument is explained in detail and diagrams showing the proper methods of installation and connection are presented.